

**SPECIAL REPORT! THE NEW MACs & PCs**

# KEYBOARD

MARCH 1994

**NINE  
INCH  
NAILS**

**Hardcore  
Electro  
Metal  
A Raw &  
Twisted  
Interview  
with Trent  
Reznor**

**REVIEWS**

**AKAI DR4d  
DIGITAL  
MULTITRACK**

**VISION 2.0**

**MIDISCAN**

**E-MU MORPHEUS**

**DR. JOHN**

**KORG 01/W  
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# *interactive*

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**Cover:** Photograph by Marina Chavez

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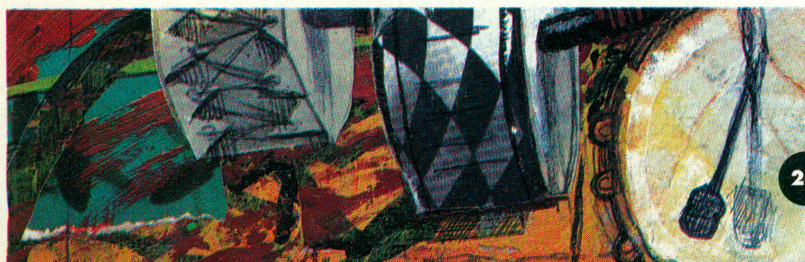
Jeff Rona tones it down on *The Lipstick Camera*.

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DOMINIC MILANO



## HE'S BACK, HE'S BAD

IT WASN'T ALL THAT LONG AGO that the lynch mobs were rampaging across our Letters page, demanding that all manner of horror be visited upon the evil one, **Connor Freff Cochran**, and his minions, those faithful readers who dared voice their support for the evil one's Creative Options column. Overall, the mail ran fifty-fifty between kudos and daggers. One of my favorite free-lancers routinely questioned my sanity for printing, as he put it, "the new age spew of a Tolkien wannabee," while I can't tell you how many would-be contributors submitted articles written in Freffese. Even the staff was divided on what to do with Mr. Cochran's wild column.

Which I found quite amusing. I mean, that single page and a half drew more letters than anything else in the magazine. One of my favorite I-hate-Freff missives summed things up rather nicely: "I've had it. Month after month I try not to read this trash. It makes me crazy. But I couldn't stop myself again. . . ."

Creative Options, love it or hate it, made people think. It got the blood boiling. It made for one heck of a lively Letters column. It went away awhile ago.

Those who noticed sent letters either to praise us for finally coming to our senses or to condemn us for buckling under to pressure from wicked corporate powers who couldn't stand the heat of the controversies the enlightened one touched on. In fact, Creative Options went away for neither of those reasons. It got deep-sixed because I felt two creativity columns were one too many. Coincidentally, Connor had lost interest in the column and was going off to pursue the muse of the artiste. He was developing scripts for interactive rides for Sony and talking the big talk of Hollywood — movies and the like.

Months passed. The letters pro and con kept trickling in. Life at *Keyboard* Central was just the way we like it — crazed. And then Connor showed up with three new installments of Creative Options in hand, promising three more within a week and another six to come shortly

thereafter, if we wanted them.

The staff powwow that followed was predictable. "We should bring Freff back." "No, we shouldn't." "Yes, we should." "Shouldn't." "Should." "Shouldn't." "What about Aikin's Other Windows?" Oops. Aikin spoke up. "I don't feel I have much to say right now in Other Windows. I could stand a break."

Let's cut to the chase. Get them cards and letters fired up. Creative Options is back.

• • • • •

More changes: Welcome a new assistant editor this month. **Ernie Rideout** comes to us from Roland, where he was the editor of the *Roland Users Group* magazine. You've probably seen his byline in recent issues of *Keyboard* and other mags, where he's shown off his chops with MIDI sys-ex messages and the like. Prior to his gig at Roland, he worked as a music teacher in the Mt. Diablo, California, public schools. He has also taught electronic music classes through the UCLA Extension Program. Ernie will be splitting his duties between *Keyboard* and our *Best Of Guitar Player* series, taking over the series editorship from Jim Aikin. This will let Aikin return to *Keyboard* full-time, spearheading our expanded sound review section (look for it soon!) and multimedia coverage.

While raiding the competition . . . er, attracting the best and brightest from around the industry, we've also just hired **Valerie Pippin**, the former East Coast advertising director for *Electronic Musician*. Val is replacing Randy Alberts, who was forced to depart due to health problems, as Vicki Hartung's assistant ad director.

Still more news from the front: Senior associate editor Robert L. Doerschuk wanted me to point out how cool and suave he is now that he's gigging Friday nights at San Francisco's Washington Square Bar & Grill, one of the in-hangs for Bay Area journalistic and political heavyweights and miscellaneous celebs. ■

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(Read this in a low voice with reverb)

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## How're We Doin'?

Since I've been outspoken to you on a few occasions about how quick a read (= dull) many recent issues have become (for me), it's only fair play's turnaround to send you some well-earned praise. The past three or four issues have been first-rate. The interview with John Adams [Nov. '93] was one of the best *Keyboard* has printed, and it embarrasses me that I took so many more pages last year to say far less of worth. Good, insightful commentary like this about so-called serious composition is rare indeed. Like to meet him someday. Also, all of the piano issue [Dec. '93] is first-rate, with some fine, practical insights into the "pre-synth 88." Gold stars for cast and crew!

Wendy Carlos  
New York, NY

Considering the amazing amount of nit-picking and belly-aching that scorches virtually every month's Letters column, I thought I'd take time to genuflect with gratitude before your Sept., Oct., and Nov. '93 issues: stellar interviews with Shaffer, Townshend, Grusin, Jane Child, Ernest Gold, Marcus Roberts, and John Adams; an incisive piece on the MIDI O.S. wars; the delightful Rhodes Chroma retrospective (Remember the first time you played one? I wet myself!); Anderton's useful programming tips; the techno guide; the four-stage home studio piece; the typically broad (and objective) range of music reviews; a good balance of equipment and software reviews. Am I missing something, or are youse guys missing virtually nothing?

And, hey, I like the ads! Part of the charm of reading *Keyboard* is the drool factor. I'm an old hand and not instantly wowed by every new geegaw, but ads are step one of the process by which I decide if I can make practical use of Box X. Besides, they pay the bills, and if *Keyboard* doesn't eat, we don't read. So, attention, complainers: Dummy up or bend over!

If you revile Jim Aikin, read Dave Stewart, and vice-versa. Bitching about one issue or article is gallingly stupid. Review a full year, and then we'll see if you have a valid complaint. Peculiar that modern 'boards have more flexibility than the minds of many who play them. I mean, gag me with a SMPTE stripe! Get thee some perspective, f'godsakes!

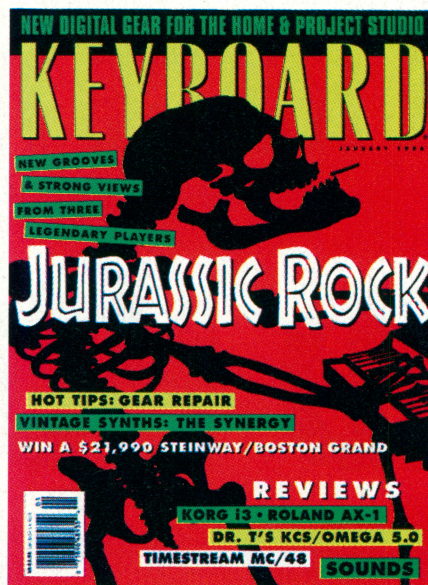
If you want to cancel your subscription to this musical motherlode over some petty objection, you should be subjected to a session of acu-beating, in which you're hit in the head hard enough to knock your mental gears back into the proper configuration. Cures buttheadism, and it's good for what ails ya.

Just three more superior issues among many, folks. Thanks.

Sparky the Magic Piano Tuner  
Dobbs town, Malaysia

## Jurassic Rockers

Robert L. Doerschuk's interview with Jon Lord was great [Jan. '94]! The article got right to the heart of what I've always wanted to dis-



cuss with Jon — why the Hammond organ is still his foundation instrument with Purple.

By the way, the "mystery jack" in the picture of the Rhodes on page 93 was the DIN-type connector that went to the powered amp and speaker cabinet on which the Rhodes sat. Also, the Hammond is Lord's C-3, not a B-3. The only time I ever saw Jon play a B-3 was at an outdoor concert in the Boston Commons in 1973 on the Machine Head tour.

Thanks for stirring up the good old memories. I think I'll go crank up my Hammond and play "Highway Star." Okay, so I'm a dinosaur — sue me!

Scott E. Shuster  
York, ME

Thanks for the Jon Lord interview. Although it was short, it was something I've waited for you guys to do for a long time. But as much as I eagerly await a solo recording from Lord, it wouldn't actually be his first. Two years ago, while shopping for CDs in a local record store, what did I see in the \$1.99 bin but a Jon Lord album titled *Sarabande*. It's an excellent blend of rock and classical, played on a great collection of Jurassic keyboards as only Lord could do.

Robert Vazquez  
La Verne, CA

I don't care how much grunge music has

inundated our culture: It is inappropriate to use the word "fuck" in a periodical. Not that anyone cares that Al Kooper wants to "fuck your two-manual organ," the analogy is lewd. *Keyboard* is wrong if it thinks that anyone in the professional music business is interested in it. *Keyboard* is supposed to propagate a knowledgeable view of what is going on in current music and technology; if it sinks to the level to which the rest of society is sinking, it will do nothing but promulgate that process.

An Interested Reader  
Columbus, OH

## Troubleshooting 101

Craig Anderton's article on equipment repairs [Jan. '94] was quite good. Years ago I learned these sorts of things the hard way while on the road as a keyboard technician with various bands, so I'd like to share a bit of advice that could prevent equipment damage.

I have repaired numerous late-model synths that had low distorted output in one or both stereo outputs. Shorted FET transistors in the noise suppression circuit are usually the cause. These transistors momentarily shunt to ground any thumps and surges generated during initial power-up, which protects speakers and equipment from undue strain and eliminates offensive noises when everything is turned on.

Manufacturer service reps have told me that the transistors are being destroyed by electrostatic discharges generated when a user plugs a patch cord into the synth output, then walks across a carpeted floor and plugs the other end of the cable into an amp or mixer. The static electricity in his or her body discharges back into the keyboard and fries the FETs. The proper sequence to connect your equipment is: (1) Plug AC power cords into wall outlets for all devices to ensure proper grounding. (2) Plug your patch cord into the amp or mixer. (3) Now you can plug the other end of the patch cord into the keyboard outlets.

In an emergency on the road, if the tech doesn't have the correct FET transistor to replace the blown one, he or she can simply remove the shorted one(s) and the unit will play fine. But be careful to have all the volume pots down on your amps to prevent the turn-on thump from getting to the speakers. And have the correct transistor installed as soon as you can.

Christopher Domres  
Music Tech Services  
Raleigh, NC

## Timestream MC/48

I had to smirk a bit while reading Greg Rule's review of Timestream's Visual Conductor [Jan. '94]. Rule said that Conductor had some trouble responding to meter changes — which are actually program changes — when using Passport's Pro 5. Pro 5 has the wonderful ten-

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## LETTERS

dency to corrupt data when saving, loading, editing, or doing just about anything else. Pro 5 probably screwed up the program changes in Rule's sequence. And I bet that when Rule attempted to use it in Vision and Musicshop, he was using the same corrupted sequence, which caused the error to repeat.

I don't know anything about Conductor, but knowing Pro 5 as I do, I would blame the software before blaming anything else. But, hey, I could be wrong: I'd be interested to know if the problem occurs when the sequence is actually created in Vision or some other program.

Matthew C. Haines  
Burbank, CA

[Greg Rule replies: "I'm surprised to hear of your troubles with Pro 5. I've been using the program since its inception and have never encountered the types of problems you've described. Just for the record, the Pro 5 sequences used in our tests were examined thoroughly with a MIDI ViewPort, and no corrupt or extraneous data was present. Also, the sequences used in our MusicShop and Vision tests were created fresh with those sequencers, not imported from Pro 5."]

### Learning From Luddites

Please, somebody. Tell Jim Aikin to calm down a little. I mean, the guy's my hero. He's

a champion of education, reflection, and creativity tempered by restraint and taste. But his Jan. '94 Other Windows column suggests that today's musician is into a whole rebellious trip and isn't aware of the history that he or she purports to stand on its head, parody, or otherwise diss. This ignores the fact that throughout history what might be called the "orgiastic/festival song" has figured prominently in the mind of the common man and woman. In other words, society has always provided means for people to work their damn jobs all week, then get drunk, fuck, and crank up Megadeth for the weekend.

Lest Aikin think that the children of today's post-punk rockers won't be able to think of anything more extreme than body piercing, he should be aware that in mid-18th century France and Germany, members of trade guilds would celebrate by making "rough music," or what was colloquially referred to as *katzemusik*. This involved beating pots and pans and sticks. It also involved beating bagsful of cats to death with knouts, and tying cats to strings, lofting them into the air, and burning them to death. That would be one hell of a wild sample, assuming you could capture a nice image before the ASPCA came down on you.

Further, I am not convinced that headbang rock is somehow allied to addictive behavior. I've seen all too many young people mosh their way to love, then fall out of the scene, get jobs, move in together, and start talking about responsible parenthood to think that the "Megadeth

lifestyle" is somehow aligned with serious alcohol/crack/etc. addiction. Most of the people I know who work at Denny's eventually intend to take a high school equivalency exam, then go on to college and into the job market. You know, like people.

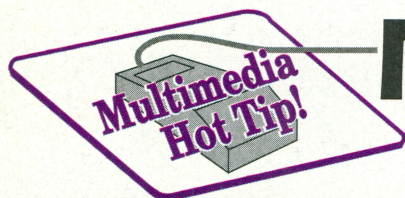
John Jainschigg  
Astoria, NY

All Jim Aikin's Jan. '94 column really says is that roses smell better than shit. But it does offer hope that modern culture will shove its head so far up its ass that it may finally come out somewhere else and sniff pleasing aromas once again.

Kelly Gaulke  
Weslaco, TX

Other Windows recently carried a new author profile: "Jim Aikin has . . . been replaced by a machine." This is no joke. I used to find Jim's writing perceptive and thought-provoking. Nowadays it seems that he simply sequences random clusters of 26 geometric shapes, increases the frequency of certain samples ("artist," "computer," "popular culture," etc.), and submits a printout of the results.

In its Sept. '93 column, for example, the Aikin Random Copy Generator spews forth more than two pages of repetitive gab to remind us that computers can never replace art. "Most of us aren't Benny Goodman," it spouts in Oct. '93. Its thinly disguised July '93 plug for the



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K2000 concludes with the statement that "our industry is market-driven." These unremarkable axioms could have been summarized in one line by most eighth-grade students, assuming that the student wanted to put such blindly obvious postulates into print.

There are two possible solutions to this sad state of affairs. Dominic and the rest of the staff could spend some time updating the algorithms in the Copy Generator. Alternatively, you could reduce Jim's retainer and ask subscribers to send in money only if they can identify articles *not* written by the Copy Generator, a scheme which could prove both simple and inexpensive for the readership.

James Layman  
Brussels, Belgium

### Techno Coalition

Ever since you published Greg Rule's article on our organization, the Northwest Elektro-Industrial Coalition [Jan. '94], our phone has been ringing off the hook and our mailbox has been overflowing with inquiries. We are planning to write a "how-to" pamphlet that will explain how to start a similar coalition in your own hometown. We also hope to form a Coalition Alliance to link with the techno/industrial scenes in several major cities. One small complaint: Several of the NEC bands want to know why they weren't listed in the article. So, if I may, the current NEC projects are: And Christ Wept, Internal Combustion, Kill Switch . . . Klick, Nox-

ious Emotion, the Same, Shallowhead, Synthesia Murder Program, and Terminal.

Devin Alexander Sebastian  
NEC

539 Queen Anne Ave. North/Box 131  
Seattle, WA 98109  
Tel: (206) 233-8420

### Acoustic/Digital Piano Blowout

I never take anyone's advice or comments as law, especially if they come from brochures or salespersons who may be pushing the most expensive or out-of-date keyboard. I was therefore pleased to see your objective reviews of weighted keyboards and piano sounds. Since I have never played piano, I cannot detect the differences in sound or feel that your staff notices. And I appreciate the fact that *Keyboard* is less biased than any manufacturer brochure. This makes your Dec. '93 issue on digital and acoustic pianos a godsend.

R. Michael Killion  
Indianapolis, IN

Thank you for your honest review of sampled pianos. They certainly are a mediocre lot, aren't they? Maybe these companies will start listening to their own products before marketing them in the future.

Jeff Lorber  
Pacific Palisades, CA

You acknowledge Larry Fine in your Dec.

'93 article, "How to Buy a Piano." I would like to point out that Fine's *The Piano Book* is, by his own admission to me, not a scientific, in-depth analysis of any brand or specific model of acoustic piano. It is, in fact, an entirely subjective collection of opinions of his and a select handful of his friends who tune and work on pianos. In many cases, they have had very little contact with particular brands, and their opinions are based on old as well as newly produced instruments.

Robert J. Jones  
Samick Music  
City of Industry, CA

Your Dec. '93 articles on the piano were well-researched, interesting, and written well enough to clip and share. Here's to more articles such as your Steinway piece and the piano history, which I sent to Alicia de Larrocha. Keep it up!

Ruth Slenczynska  
Edwardsville, IL

### Home Studio Solutions

Your home studio issue [Nov. '93] was the best issue since your infamous Buyer's Guide in 1990. The tips and suggestions were right on, and the personal accounts were, for the most part, unbiased.

As for myself, I would call my current home studio a System 1.5 by your standards — not

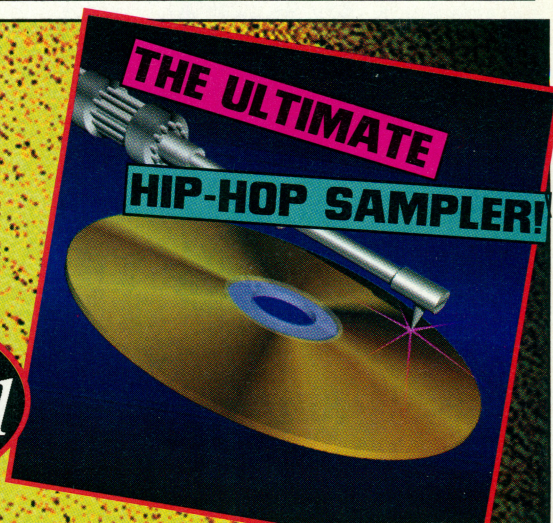
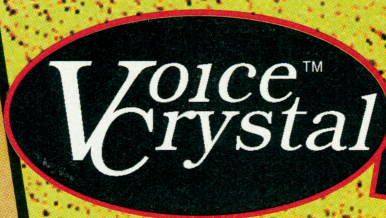
*Continued on page 152*

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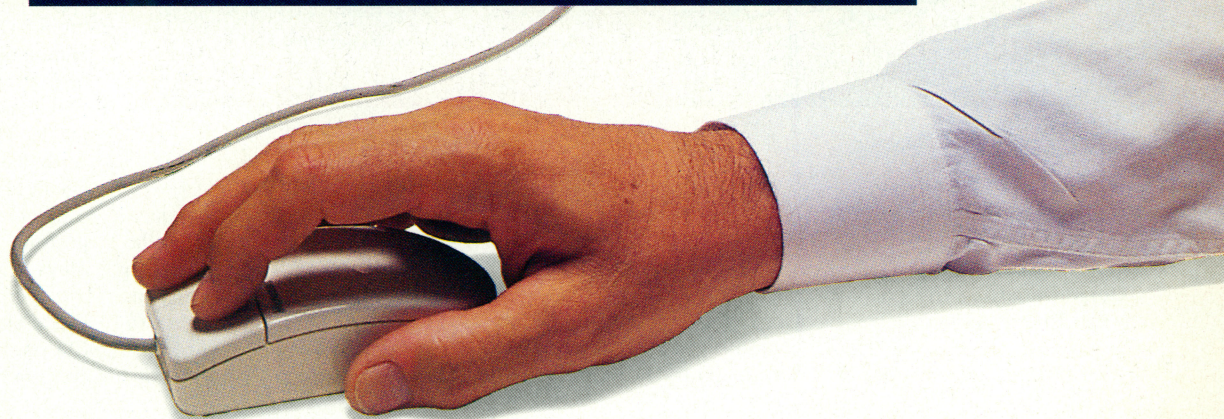


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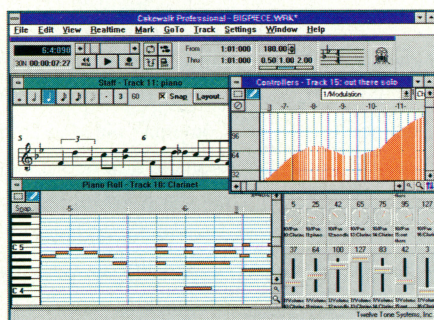
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for Windows

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Assembled by Robert L. Doerschuk.

Overseas correspondents:

Mathias Becker, Ken Hunt,

Peter Machajdik, Lesley Sly, Daniel Sofer,

Arnaldo de Souteiro, Richard Trythall.

## CAREER UPDATE

**Duran Duran** as a cover band? Why not? Their next album, recorded largely on the road during their '93 tour, features their versions of

Public Enemy's "911 Is a Joke," Led Zeppelin's "Thank You," Elvis Costello's "Watching the Detectives," David Bowie's "Diamond Dogs," the Doors' "Crystal Ship," and other unlikely titles. (Wot, no "Louie Louie"?) As ever, **Nick**

**Rhodes** handles the keyboard parts. Look for it in March. . . . Caroline Records will release a live album by **Anderson, Bruford, Wakeman, Howe** on Feb. 25. Titled *An Evening of Yes Music Plus*, the double CD set captures the group on-

stage in San Jose, California, during their 1989 tour. Titles include "Starship Trooper" and an acoustic rendition of "Owner of a Lonely Heart." A new solo album by **Rick Wakeman** follows on Caroline in March. . . . A two-week East Coast tour by **Ozric Tentacles**, with **Joie Hinton** on keys, and **The Orb** may be underway in March. . . . Possible odd couple of '95: ambient music master **Harold Budd** and **XTC's Andy Partridge**, who have been talking about doing a collaborative project next year. . . . Japanese jazz/new age star **Keiko Matsui** plays piano and writes several arrangements on the upcoming **David Lindley** album. . . . A two-CD package of Bach keyboard concertos is coming your way this



## COMPTON'S NEW MEDIA

On Nov. 16, 1993, United States patent no. 5,241,671 was granted to Compton's NewMedia for the data retrieval system used in their MultiMedia CD-ROM Encyclopedia. The patent defines the product as "a multimedia search system using a plurality of entry path means

which indicate interrelatedness of information," as well as "a database search method that retrieves multimedia information in a flexible, user friendly system, searching multiple databases consisting of text, picture, audio, and animated data via multiple entry paths."

Sounds a little fuzzy? Check further into the patent copy: "It is contemplated that this invention can be used with any information that is stored in a database." It's this part of the patent, and Compton's three percent licensing cut, that has the entire multimedia industry browsing for more than 3-D dinosaurs on their CD-ROM encyclopedias: "Let's see. . . . Ah, there it is: 'Lawsuit.'"

Shortly after the patent announcement, industry giants such as AT&T, Apple, and Microsoft charged that Compton's data-retrieval system was not unique, that it used technology invented long before the patent application was filed for Compton's SmartRieve in 1989,

and that they'd all fight to prove it. But Compton's NewMedia CEO Stanley Frank insists, "We simply want the public to recognize Compton's NewMedia as the pioneer in this industry. We want to promote a standard that can be used by every developer, and be compensated for the investments we have made to make multimedia a reality for end users."

Specifically, Compton's licensing fee retrieval plan gives multimedia companies the following choices: (1) Develop their products as joint ventures with Compton's; (2) sign up to use Compton's distribution channels; or (3) comply with a three-percent royalty structure payable to Compton's. This royalty scheme would cost larger companies dearly, and may be enough of a burden to keep some smaller multimedia developers from ever reaching end users at all.

The decision on whether the Compton's patent will stand rests with the U.S. Patent and Trademark Office and could take months, if not years, to wrap up. In addition, global changes in patent documentation will no doubt affect the Compton's controversy. On the heels of NAFTA and GATT comes WIPO, the World Intellectual Property Organization, in Geneva, which has drafted a pact designed to unify the world's maze of patent systems and enhance the newly greased world trade channels.

Or will it? Today, only the U.S., the Philippines, and Canada use patent systems based on "first-to-invent," in which a patent is awarded to the first person who comes up with an invention. WIPO's pact, if adopted, would enforce the "first-to-file" format now used in the rest of the world and spearheaded by Japan. This method, also favored by larger U.S.-based international companies interested in making a patent bonanza overseas, awards the patent to the first person to file for an invention, even if someone else comes up with the idea for the invention first. The latter format could



summer, courtesy of **Vladimir Feltsman** and the Orchestra of St. Luke's. . . . **Edgar Winter** will have a new solo CD out this spring. Talks are underway for a Winter tour of Europe in the late spring, with a band that includes drummer **Carmine Appice**. . . . *Playing Dangerous*, scheduled for release in mid-March by Mosaic Films, features a sequence-driven soundtrack by **Keith Arem**, founder of the industrial quartet **Contagion**. The entire group — Arem, **Michal Pedriana**, **Jack Boughner**, and **David Smith** — collectively scored *Skinner*, starring Traci Lords and produced by Ivan Nagy, known in some neighborhoods as Heidi Fleiss's insignificant other. . . . Congrats to **Lynne Arriale**, winner of the Great American Jazz Piano Competition, held last October as part of the annual Jacksonville Jazz Festival. Kudos also to veteran German jazz

reinforce Compton's challenged patent and drastically change how all intellectual property is conceived, patented, developed, and ultimately sold, worldwide.

What does this mean to those who use the CD-ROM platform to deliver 600Mb chunks of audio samples into their samplers and computers? For now, nothing. Audio-only CD-ROMs are singular chunks of data that can be browsed and organized with a single database to search for individual samples. This differs from most CD-ROMs, in which data-compressed movies interact with text or audio soundtracks reinforce graphics, each element having its own database that must be searched.

But future interpretation of the Compton's patent, as well as the world's changing attitudes about intellectual property itself (read: software) may change the way everyone conceives, develops, and eventually consumes the average multimedia diet. At press time, Compton's NewMedia (and their parent company, Tribune Publishing) were refusing to comment until the Patent and Trademark decision had been rendered. Stay tuned for more details.

—Randy Alberts



## "Broken Hearts Are for Assholes,"

proclaims one title in the vast catalog of works by Frank Zappa. So let's stick with the facts: He was born in Baltimore and raised in California. Way back in the '50s, before weirdness became fashionable, he was putting bands together with names like Captain Glasspack and His Magic Mufflers. He was set up by the San Bernadino Vice Squad in the early '60s for his involvement in putting together a porno tape; his ten days in jail got him out of the draft. In 1965, shortly after joining an R&B outfit called the Soul Giants, he took over the group, renamed it the Mothers Of Invention, and launched into nearly three decades' worth of musical iconoclasm. He satirized Jews, Arabs, Catholics, hippies, businessmen, Valley Girls, groupies, moralistic busybodies — everyone, as he suggested to a heckler on a live track from *Burnt Weenie Sandwich*, who "wears a uniform."

His music drew from a multiplicity of apparently incompatible inspirations, which somehow fit together after being run through the Zappa blender. His most celebrated influence was the complex, percussive works of Edgard Varèse, whose widow he eventually befriended. Zappa's own large-scale compositions included sections written for a 50-piece ensemble in *Lumpy Gravy* (1967), the score to his pioneering film *200 Motels*, which Zubin Mehta and the L.A. Philharmonic recorded in 1970, a series of pieces premiered by the London Symphony Orchestra in 1983, and *The Perfect Stranger*, commissioned by Pierre Boulez and premiered in Paris in 1984.

Outrage shadowed Zappa: A gang of U.S. Marines stormed the stage and began dismembering dolls at one Vietnam-era gig. In London the jealous husband of a fan seriously injured Zappa by shoving him into the orchestra pit. And a squad of New York policemen invaded and broke up one Mothers session, an altercation recorded and preserved on *No Commercial Potential*. In 1985 he began battling efforts to censor rock lyrics; in Congressional testimony, he dissed Tipper Gore's Parents Music Resource Center as a bevy of "bored Washington housewives" who wanted to "housebreak all composers and performers." He produced records by Grand Funk Railroad and a street character named Wild Man Fisher. Some of the best musicians of our time passed through his band: Steve Vai, Adrian Belew, George Duke, Jean-Luc Ponty, Terry Bozzio, Tommy Mars. Unlike most people in this business, he used music technology — in his case, the N.E.D. Synclavier — as a tool to explore his creative resources, rather than as timbral window dressing. He died of prostate cancer last Dec. 5, just before *Playgirl* came out with a cover story on his son, Dweezil.

Keyboard will examine Zappa's legacy in more detail next month. In the meantime — well, okay, we're assholes. We'll miss you, Frank.

—Robert L. Doerschuk



pianist **Karl Berger**, recipient of the German radio network SWF's annual Jazz Award in recognition of his recent recordings on the Black Saint, Bellaphon, and Enja labels.

## INDUSTRY UPDATE

**PIANODISC SIGNS STEINWAY ARTISTS.** PianoDisc, known for its disk-based system for recording and playing back performances on pianos, has signed an agreement with Steinway & Sons. In ex-

change for a Steinway D grand piano at their studio, PianoDisc will begin recording performances by selected Steinway artists. Two pianists on the Steinway roster, **Andreas Klein** and **Laura Spitzer**, have already done sessions for PianoDisc. Talks are underway to create a separate studio at Steinway Hall in New York for additional PianoDisc dates. Additional details are available from PianoDisc, 4111 N. Freeway Blvd., Sacramento, CA 95834.



## R.I.P.

**JERRY HUNT, 1943-93.** Known for his collaborations with performance artist Karen Finley, composer and software designer

Joel Ryan, and visual artist Maria Blondeel, Hunt was trained as a pianist at North Texas State University. In the early '70s, he began work as a technical consultant for audio and video product manufacturers. Subsequently, he branched into solo recitals, in which he combined electronic, mechanical, and hybrid interactive systems in performances based on mystical and occult ceremonial practices. Hunt, who died of lung cancer, leaves a legacy of recorded work on several labels, including

# JIMI HENDRIX

## ONE MORE ENCORE

## WITH BEAUTIFUL PEOPLE

**W**ith the familiar riff to "The Stars That Play with Laughing Sam's Dice" keening on Korg T3, Roland U-20, and Roland Jupiter-6, Jimi Hendrix digs into his Strat and lays down a burning comp behind drum loops that hammer a house groove. . .

What's wrong with this picture? Nothing at all, say guitarist Du Kane and synth/sample specialist Luke Baldry of Beautiful People, whose new album, *If '60s Were '90s*, on Continuum, paints a picture of Hendrix descending from the heavens and jamming with musicians who were busy being born just as he was checking out.

Kane and Baldry came up with the idea of fusing Hendrix samples with modern rock in the late '80s. "The acid house scene had started up, and its parallels to the '60s were quite appar-

ent," he recalls. "The music was very trancy, kind of trippy and hallucinogenic. The philosophy that was going on in the '60s was coming through in the '90s: Everyone was into peace and love and being nice to each other at clubs for a change. But musically, people were using samples instead of guitars, and nobody was sampling Hendrix particularly. So we just had this one-off idea: Let's be the first people to sample psychedelic guitars, and let's use Hendrix because he was The Man."

With help from Eric Clapton, whose nephew had heard their work, Beautiful People won the support of the Hendrix estate for their project. Once access was granted to the late guitarist's vast catalog, Kane and Baldry dove into a year and a half of musical alchemy. Most of what they sampled came from CDs, although some isolated vocal or guitar tracks were taken from original tapes provided by the estate. Snatches of conversation, licks from unreleased jams, and sections of classic Hendrix performances fall right into place inside Roland TR-808 drums and original drum samples. The effect is eerie, especially in the cut titled "Rilly Groovy," where Hendrix says, "It's so groovy to

**One of them is Du Kane, and one of them is probably Luke Baldry. The others are other Beautiful People.**





O. O. Discs, Irida, and The Aerial.

## BULLETIN BOARD

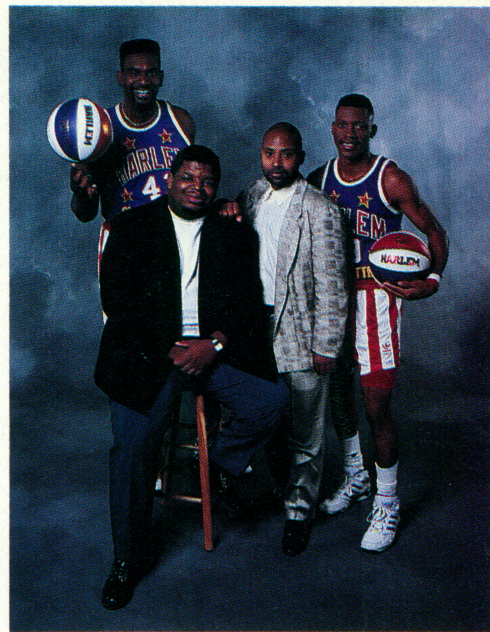
**INTERACTING IN ATLANTA.** The first Electronic Entertainment Expo takes place Apr. 7-9, 1995, at the Georgia World Congress Center in Atlanta. Billed as the first international trade show dedicated exclusively to entertainment software titles, programming, and licensing properties, EEE expects 30,000 attendees to wander down aisles lined with video game machines, multimedia computers,

and CD-ROM, CDI, and 3DO systems. Seminars for developers and programmers are also being planned, on subjects ranging from showcasing products to raising investment capital. For more on this ground-breaking show, interact with the helpful folks at (800) 800-5474.

### SCHOLARSHIPS FOR THE BLIND.

The National Federation of Music Clubs is offering 15 awards and scholarships to talented blind musicians and composers. These include the Hinda Honigman Scholarship, which offers \$500 to a selected blind vocalist or instrumentalist and \$250 to a runner-up, eight Music for the Blind Performance Awards of \$200 each,

## slammin' with the globetrotters



**the** Harlem Globetrotters are slam-dunking to a new tune. After half a century of dazzling audiences and humiliating opponents to the tune of "Sweet Georgia Brown," the team hired Stanley Chance Howard and Kenneth Towns to revamp their music. The Minneapolis duo, whose credits include tours with the Commodores, Chaka Khan, and Wynton Marsalis, responded with a set of sequenced, street-dance pieces designed to complement the Globetrotters' updated, high-tech shows. With MOTU Performer running, E-mu SP-1200, Ensoniq EPS-16 Plus, and Linn 9000 drum sounds slamming, and a battery of synths buzzing, the feel is hip-hop/jazz. Some Three Stooges *nyucks* and cartoon noises, the latter culled from a Saturday morning cartoon sampling session, also show up in the "Globie Theme," written for the team's bulbous-headed mascot. And don't worry, longtime fans: "Sweet Georgia Brown" remains in the show as the team's musical centerpiece. It's all available on CD and cassette through Harlem Globetrotters International (6121 Santa Monica Blvd., Hollywood, CA 90038) and at the games themselves; check local papers to see if their current world tour passes near you. Pictured above (L to R): "Sweet Lou" Dunbar, Howard, Towns, and Reggie "Airman" Jackson.

—Robert L. Doerschuk



come back here this way," before kicking into a solo.

"That was weird," Kane agrees. "The song was about the Monterey Pop Festival. I've seen the movie a lot of times, and it's the happiest bit of film I've ever seen of him. He obviously was at the peak of what was going on. The whole atmosphere seemed to be really groovy; that was the phrase. So I was looking at in-between-song chit-chat for when he used the word 'groovy.' It wasn't intended to say, 'Hey, we're bringing Jimi back.' It's just that I liked his voice. It opens up areas of understanding the sort of guy he was."

Beautiful People, buttressed by slides and films, will conjure the spirit and sound of Hendrix on their American tour, beginning in March. "We'll run a lot of the samples," Kane says. "But it won't be something you'd watch and say, 'Hey, it's all on tape.' I mean, we are a rock and roll band. Besides, Hendrix wouldn't do it that way."

—Robert L. Doerschuk



and the W. Paul Benzinger Memorial Music for the Blind Performance Award of \$200, which is reserved for singers and players younger than age 14. Deadlines for application to all awards are in March. For a complete list of scholarships and eligibility requirements, write the National Federation of Music Clubs, 1336 N. Delaware St., Indianapolis, IN 46202, or call (317) 638-4003.

**'SHEDDING WITH BILLY TAYLOR.** Jazz legend Billy Taylor heads the piano faculty at this year's Jazz in July Improvisation Workshop. The annual two-week seminar takes place on the campus of the University of Massachusetts at Amherst, where Taylor joins drummer Max Roach, violinist John Blake, multi-

reed player Yusef Lateef, and other faculty luminaries. Application deadline is March 21. For details, call Mark Baszak, associate director of the University's Fine Arts Center Multicultural Programs, at (413) 545-3530.

**INSIDE INFO FOR SONGWRITERS.** The bimonthly *Songwriters Tipsheet* offers updated listings of music publishers, record producers, record companies, and ad agencies who have expressed interest in receiving new material. Other regular features include news about changes in royalty and copyright law, lists of songwriters looking for collaborators, and tips on recording demos. To subscribe,



send \$39.95 to New Sound Music, Box 37363, Oak Park, MI 43237, or call (313) 355-3643. . . . The *Songwriter's Survival Kit* offers tips on how to protect music copyrights and maximize royalty income. Author Elizabeth Granville, whose credits include heading BMI's music publisher division and private work as a copyright attorney, also shares insights on how to record effective

demos and make sure that the right record label executives hear them. To order a copy of the *Songwriter's Survival Kit*, write to Granel Press, 40 W. 57th St., Ste. 903, New York, NY 10019, or call (212) 969-9280.

**WHAT ZAPPENING AT ZAKROS.** San Francisco's Zakros InterArts center for electronic music and media arts offers a variety of courses for beginning and professional performers. Recent classes ran the gamut from introductions to MIDI through music for QuickTime, with special seminars on live multimedia performance, soundtrack composition with Opcode Studio Vision, and creative appli-

## NATASHA SHNEIDER of ELEVEN **SAYS NYET to SYNTHS** HARDCORE ORGAN ROCKER

**J**ust a bit over ten years ago, Natasha Shneider was diligently practicing classical repertoire at the Prokofiev Music School in Moscow. Now, she's ripping mean riffs with Eleven, an L.A.-based trio whose track record includes tour dates with Mary's Danish, Soundgarden, and Pearl Jam. Their self-titled debut album, a study in stark musical aggression, is about as far from *Lieutenant Kije* as you can get. But for Shneider, it's been a natural progression.

"Bach and Prokofiev are still my biggest influences," she insists. Her precise, Slavic-inflected English suggests the kind of disciplined intellect it takes to succeed in a strange land. "And Glenn Gould is the only keyboard player I really look up to."

One can only wonder whether Gould would have appreciated Shneider's raw, overdriven textures, the glue that binds the work of

guitarist Alain Johannes and drummer Jack Irons in Eleven. But there are similarities in their aesthetic, especially in their preferences for imposing limits on themselves. For Gould, it was a limitation in repertoire; for Shneider, it comes down to equipment. In the studio and onstage with her band, she plays only one keyboard, a Hammond XB-2, with the bottom two octaves driving a Peavey DPM Spectrum Bass module and occasional flavorings from E-mu Vintage Keys in the upper registers.

"Basically, I'm a piano player," she says. "I play bass with my left hand and organ with my right hand: That dexterity, the ability to play absolutely different functions in each hand while singing something else, comes from years of playing piano. But right now I'm very much into the organ: It's got sort of a timeless sound. Synthesizer sounds kind of bore me. And some keyboard players get into the gear aspect so much that they seem to lose the point. They get off on the fact that they've found another sound, but what does that mean without musical content? I would much rather hear somebody playing one silly little instrument but developing his or her harmonic thinking and rhythm."

Not surprisingly, Shneider has little interest in virtuosity for its own sake. In Eleven, she consciously restricts her right-hand work to leave room for Johannes's guitar. This concern for creating a unified, albeit cacophonous, sound explains why Shneider handles the



**All three of Eleven (L to R): Jack Irons, Natasha Shneider, Alain Johannes. Facing page: Natasha on Hammond Suzuki XB-2.**



cations for HyperCard users. Upcoming schedules are available from Zakros InterArts, 614 York St., San Francisco, CA 94110; their fax number is (415) 282-4228.

**MAJORS AND MINORS.** A broad range of music industry disciplines, from synth programming to record label publicity, from studio engineering to talent agency, is covered in New York University's Music Business and Technology program. Undergraduate and graduate students in the MBT program can choose classes based on their career ambitions; marketing, artist and concert management, and manufacturing courses are available for those oriented toward the business side, while performance

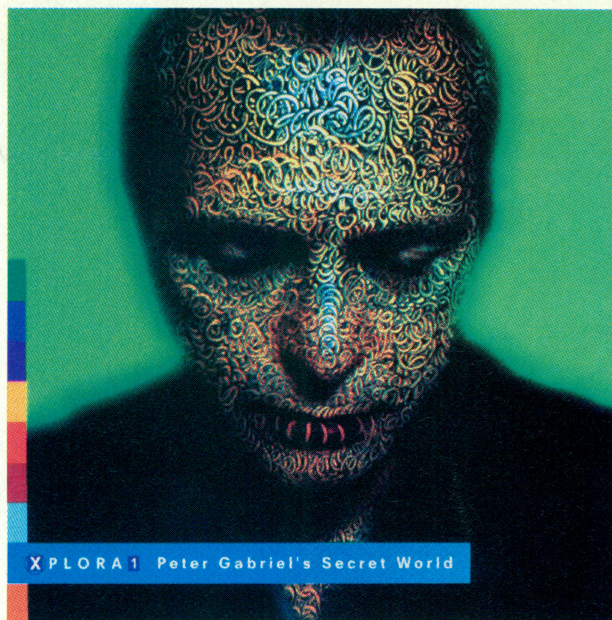
students can make use of resources ranging from standard computer and keyboard setups to drumKats and Datagloves. For further information, write NYU's admissions office at 25 W. Fourth St., New York, NY 10012, or call (212) 998-4500. . . . Southern Methodist University will offer a dual bachelor's degree in music and computer science. The program runs four-and-a-half years and will include instruction in computer hardware and software design, studio recording, film scoring, music videos, and related topics. Further information is available from SMU's Office of News and Information, Box 174, Dallas, TX 75275-0174; the phone number is (214) 987-7650. ■



bass parts herself. "I write music with the bass in mind. If you hear a C in the bass, that doesn't mean I've written a C major chord; it could be an A minor, a C minor, an Ab major, or a G major. It's very important that every note is where it's supposed to be in my music. If one note in the bass is wrong, it changes the whole feeling of what I'm trying to do. So if we had a bass player, what would he do? Would he have to play every note I tell him to? That would make him a slave. He'd have absolutely no life, and would hate me for the rest of his days."

Luckily, Shneider isn't being harassed by disgruntled bassists. Instead, she is back on the road with Eleven, rocking clubs throughout the States with their winning mix of balance and bravura. "I do not believe in too many egos in the band," she summarizes. "Once the band is an entity, you live for that. We could do so much more than what we put on record, but it's more important for us to bring out the best in the music. Restraint is quite an admirable quality."

—Robert L. Doerschuk



Emeryville, CA: Peter Gabriel was on hand last December at Northern California's Global Business Network, an international "futurist think tank," to launch his much-anticipated interactive CD-ROM, *Explora 1, Peter Gabriel's Secret World* (featured in the August '93 *Keyboard*). "This for us is the first step towards a dream," Gabriel told reporters. He expressed a strong commitment to the future of multimedia, saying all of his future releases, ideally, will be available in a variety of MM formats. *Explora* is currently available only for the Macintosh, but a PC version should be in stores by mid-1994. —Greg Rule

## FACTS & STATS

According to information released by the Department of Commerce and compiled by the National Council of Music Importers and Exporters, the balance of keyboard trade still favors overseas manufacturers. Numbers, of course, can be misleading: The quantum leap in American accordion exports from '92 to '93 may be due in part to revisions in the government's definition for that category. All \$ values are in thousands of dollars. For more on trade trends, write the NCMIE, 38 W. 21st St., Fifth Floor, New York, NY 10010-6906, or call (212) 924-9175.

### JANUARY-SEPTEMBER 1992

	Imported Into U.S.		Exported From U.S.	
	Quantity	Value	Quantity	Value
Grand Pnos.	26,316	\$67,717	4,238	\$3,009
Synths	65,593	\$14,996	53,293	\$9,132
Accordions	50,489	\$ 1,296	3,968	\$ 217

### JANUARY-SEPTEMBER 1993

	Quantity	Value	Quantity	Value
Grand Pnos.	24,183	\$72,327	3,081	\$ 2,799
Synths	99,361	\$14,020	34,603	\$11,551
Accordions	50,047	\$ 1,178	43,977	\$ 1,498





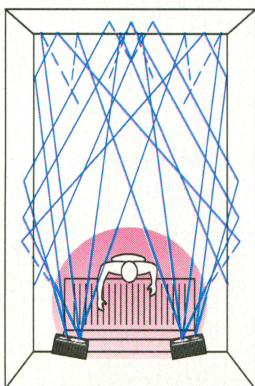
# The Truth From

The truth...you can't expect to find it everywhere you look, or *listen*. But when mixing music, hearing the truth from your monitors will make the difference between success and failure. You'll get the truth from the **Alesis Monitor One™ Studio Reference Monitor**.

## Room For Improvement

Fact: most real-world mixing rooms have severe acoustical defects. Typical home and project studios have parallel walls, floors and ceilings that reflect sound in every direction. These reflections can mislead you, making it impossible to create a mix that translates to other playback systems. Trying to solve the problem with acoustical treatments can cost megabucks and still might not work. But in the near field, where direct sound energy overpowers reflections, reverberant sound waves have little impact, as shown in the illustration. The Monitor One takes full advantage of this fact and is built from the ground up specifically for near field reference monitoring.

Working close to the sound solves the room problem but creates other problems, such as high frequency stridency and listener fatigue (typical of metal-dome and composite tweeter designs). Our proprietary soft-dome pure silk tweeter design not only solves these problems, but delivers pure, natural, incredibly accurate frequency response, even in the critical area near the crossover point (carefully chosen at 2500 Hz).



*Does your living room double as your mixing suite? The pink area in the illustration shows where direct sound energy overpowers reflected waves in a typical mixing room. The Monitor One helps eliminate such complex acoustic problems by focusing direct sound energy toward the mixing position, instead of the love seat.*

## The Truth From Top To Bottom

The Monitor One gives you all the truth you want in the mids and highs, but what about the low end? You probably know that the inability to reproduce low frequencies is the most common problem with small monitors. Most of these speakers have a small vent whose effect at low frequencies is nullified by random turbulence, or they're sealed, which limits the amount of air the driver can move. Such speakers give disappointing results in their lowest octave.

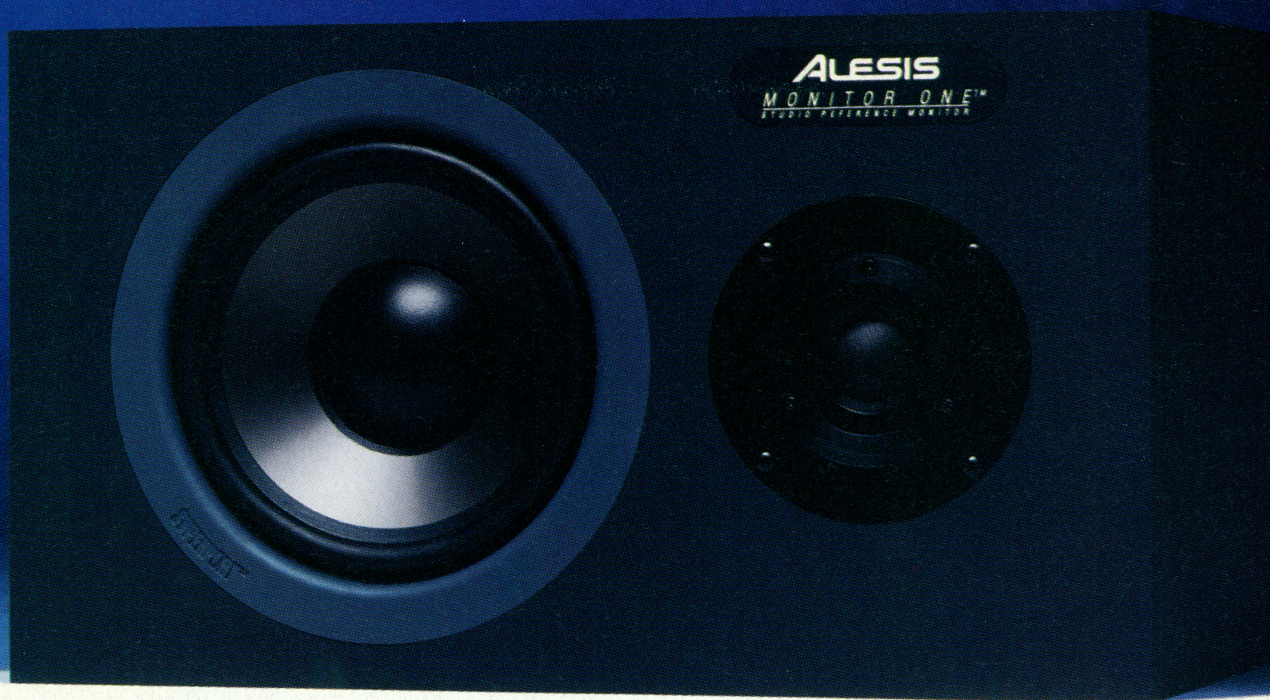
The Monitor One overcomes wimpy, inaccurate bass response with our exclusive SuperPort™ speaker venting technology. The ingenious design formula of the SuperPort eliminates the choking effect of small diameter ports, typical in other speakers, enabling the Monitor One to deliver incomparable low frequency transient response in spite of its size.



*Alesis SuperPort™ technology gives you the one thing that other small monitors can't: incredibly accurate bass transient response. No, the SuperPort doesn't have a blue light, but it makes the picture look cool.*

The result? A fully integrated speaker system that has no competition in its class. You'll get mixes that sound punchier and translate better no matter what speakers are used for playback. Whether you mix for fun or for profit, you want people to hear what *you* hear in your mixes. The Monitor One's top-to-bottom design philosophy is a true breakthrough for the serious recording engineer.





# Left To Right

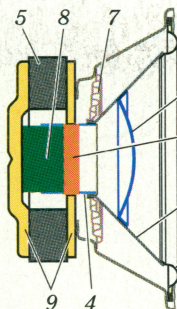
## Power To The People

High power handling is usually reserved for the big boys. While most near field monitors average around 60 watt capability, the Monitor One handles 120 watts of continuous program and 200 watt peaks...over twice the power. Also, its 4 ohm load impedance allows most reference amplifiers (like the Alesis RA-100™) to deliver more power to the Monitor One than they can to 8 ohm speakers. That means the Monitor One provides higher output, more power handling capability, and sounds cleaner at high sound pressure levels.

If you like to mix loud, you can.

## The Engine

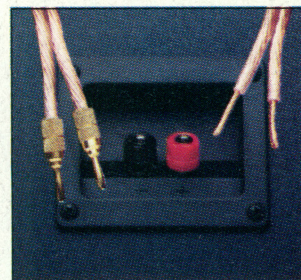
Our proprietary 6.5" low frequency driver has a special mineral-filled polypropylene cone for stability and a 1.5" voice coil wound on a high-temperature Kapton former, ensuring your woofer's longevity. Our highly durable 1" diameter high frequency driver is ferrofluid cooled (costly, but it's the best way to cool a tweeter), to prevent heat expansion of the voice coil which inevitably leads to loss of amplitude and high



A cross section of the Monitor One's proprietary Alesis-designed 6.5" low frequency driver.

1. 1.5" voice coil.
2. Mineral-filled polypropylene cone.
3. Damped linear rubber surround.
4. Kapton former.
5. Ceramic magnet.
6. Dust cap.
7. Spider.
8. Pole piece.
9. Front and back plates.

frequency response. Combined, these two specially formulated drivers deliver an incredibly accurate, unhyped frequency response from 45 Hz to 18 kHz,  $\pm 3$  dB. The five-way binding posts provide solid connection, both electronic and mechanical. We even coated the Monitor One with a non-slip rubber textured laminate so when your studio starts rockin', the speakers stay put. Plus, it's fun to touch.



The Monitor One's five-way binding posts accept even extra-large monster wire, banana plugs and spade lugs. Hookup is fast, easy and reliable.

## The New Alesis Monitor One™

You don't design good speakers by trying hard. It takes years and years of experience and special talents that only a few possess. Our acoustic engineers are the best in the business. With over forty years of combined experience, they've been responsible for some of the biggest breakthroughs in loudspeaker and system design. The Monitor One could be their crowning achievement. They're the only speakers we recommend to sit on top of the Alesis Dream Studio™.

See your Authorized Alesis Dealer and pick up a pair of Monitor Ones. Left to right, top to bottom, they're the only speakers you want in *your* field.

The Monitor One is the speaker for the Alesis Dream Studio™. Need more information about the Alesis Monitoring System? Call 1-800-5-ALESIS. See your Authorized Alesis Dealer. Monitor One, SuperPort, RA-100 and the Alesis Dream Studio are trademarks of Alesis Corporation. © Alesis is a registered trademark of Alesis Corporation.

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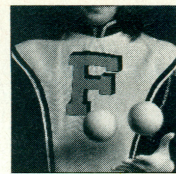
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NEW PRODUCTS!



# CREATIVE OPTIONS



CONNER FREFF COCHRAN

## MOTIVES 1: THE WRONG THING

*In the long run it is far more dangerous to adhere to illusion than to face what the actual fact is.*

—David Bohm

**T**HERE ARE WORSE THINGS THAN death, and some of them we choose. I knew that the minute I walked into intensive care and saw my grandmother's eyes.

Please notice that I did not say "looked into." Her eyes weren't letting anybody inside. Cross glances with a stranger on the street and you'll feel a moment of recognition before you look away, an awareness of brushing consciousness, a sense of some blurry mingling at the boundary between two selves. That wasn't how things were with my Grandmother. Her eyes were sealed, crammed full to bursting from the inside. They were as impenetrable to the touch of my soul as plate glass would be to the touch of my fingers. Even when she did look at me, and say my name, there was no longer any sense of *person* there — just the machinery of survival. The habit of taking another breath. Each succeeding stroke had left this relentless mechanism fewer hooks in the world, and in reaction it was holding on even more fiercely to those that remained. Ninety-eight years of memories were being raided in complete terror, each memory a spike of desperation, a way to dig in and avoid the abyssal unknown.

I have never seen more fear packed into less space than the confines of that hospital bed.

The doctor put it plainly. The only reason my grandmother was still alive was that she refused to die. It's a choice, he said. Some people are willing to make it when they reach the end. Others aren't. Eventually, their bodies make it for them. That was how Nell Cochran was going to go: When her heart was too weak to beat; when her last, lonely neuron wouldn't fire; when there was nothing left for her fear to cling to.

It is possible to be too strong.

Her ears were as closed as her eyes. She spoke often, in repeated commands and questions that had nothing to do with what was said to her. Conversation was impossible. Not knowing whether she heard me, I went ahead and

said what I had come to say, a set of messages I knew the rest of my family could not or would not say, for various reasons of their own. I held her hand. I told her what I believed. I told her that it was okay to let go. That there was nothing to be afraid of. That there is life and death, and living death, and either of the first two is preferable to the third. That if life is no longer possible, it is perfectly all right to die.

I guess I'm here, now, to tell all of you the

torture ourselves and one another. If there is a Devil, it is our willingness to trade a small death, now — a limiting of choice, a panicky blindness, a veiled truth, a refusal to face and make decisions — for the dubious short-term peace of having someone else think and choose for us. If there is Evil, its incestuous parents are our daily portions of Hypocrisy and Denial. And if there is Art, or the capacity for same, in a human soul, then it rises and falls in direct proportion to that soul's willingness to face the entire range of human thought and possibility.

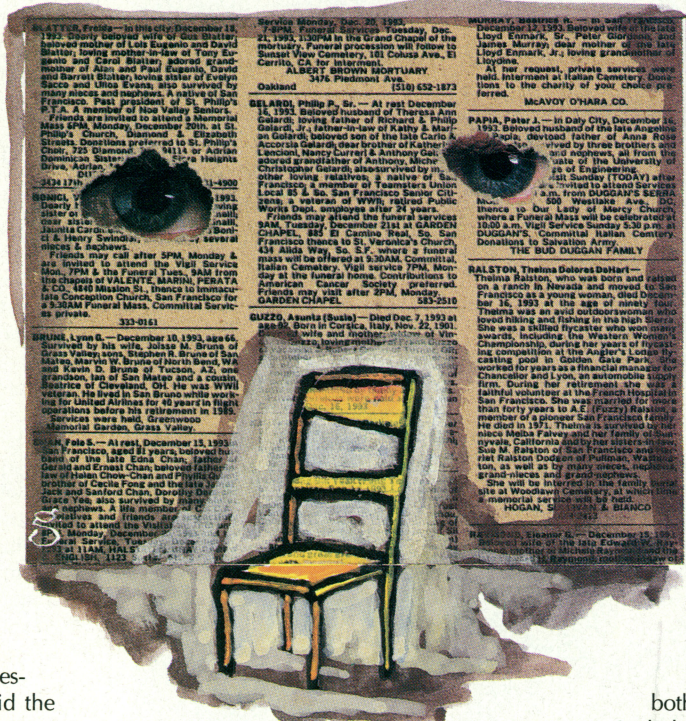
I'll put it another way. There is no sin in knowledge. There are a million sins in ignorance. And at the root of all ignorance — willful ignorance, that is, a different matter than simply not knowing yet (as when a third-grader looks on the mysteries of fourth grade math) — you will find fear.

Many people, perhaps even most, spend their lives terrified. They are so used to it that it becomes unnoticed emotional noise, as easy to deny as the low hum of an aquarium compressor. Sitting there in the background it quietly distorts . . . well, everything. Every hope, every hunger, every decision.

All your spirit has to work with in this world are the twin tools of

body and mind, and fear can poison both of them. Its effect on the mind is particularly insidious. Frank Herbert was right, in *Dune*, when he said, "Fear is the Mind Killer;" that's exactly what it is. Fear murders thought. To whatever extent you fear, that much and precisely that much of your mind is unavailable. That much and precisely that much of you is blacked out, erased, gone, obliterated, leaving you prey to control by external rule (morality)

Connor Freff Cochran is happily busy with a new partnership and new projects, including forays into that strange place called Hollywood. If you are interested in more of his explorations into creativity and life, just write c/o Crossing Point, 47 Lafayette Circle, Suite 180, Lafayette, CA 94549, and ask for a free copy of Connor's Creation newsletter.





## CREATIVE OPTIONS

instead of examined internal belief (ethics). That much of you — and precisely that much — is neither dead nor alive.

Fear isn't "natural." You aren't born with it. It's strictly learned behavior, a holdover from the inescapable pains of our childhoods, and like all learned behavior it can be unlearned, or at least mitigated.

Because there is another way to think of fear. It needn't always be something to run away from. Indeed, I have come to see it as the purest sign of fast-approaching choice, as the lens that sharpens our focus for the moment of decision, as energy unopened.

Inside fear you will always find a potent doorway.

As I write, my grandmother is still alive. Months have passed since I visited to make my peace with her mortality. Physically she is no better; perhaps a little worse. Mentally and emotionally she remains long gone, lost in the labyrinth of her own terrors. The doorway inside her current fear is a simple one, and it opens on only one place, death, which she cannot avoid forever. But it wasn't always like that. There was a time the doorway inside her fear offered a path that led to life itself, not death or the Wrong Thing.

There it is again, that phrase. The Wrong Thing: Far worse than death, no matter how you measure it. The Wrong Thing: An option presented to us a hundred times a day, in matters both small and great, earth-shaking and unnoticeable.

The Wrong Thing: *Holding back.*

Make no mistake about it. You are holding back. I am holding back. We are all holding back, every one of us. Hiding. Denying ourselves to each other and our selves to ourselves. It is something that we have learned. We do it in our work as artists. We do it as husbands and wives, as lovers, as sons and daughters, as grand- and great-grandchildren. We do it walking down the street, trading look-away glances with strangers, lacking the simple unrestrained faith that who we are is a gift to the world . . . or worse, having such repressed and buried hatred for life that we deny giving ourselves out of sheer spite for the rest of creation.

It's a dangerous road, the Wrong Thing. It makes a waste of living and removes all value from death. It is an orchestra sawing on Middle C for three score years and ten, then screaming for one more chance to play, please, after the audience has left the hall.

I told you earlier that I didn't see the Wrong Thing, at first, and looking on the fear in my grandmother's eyes I didn't. But then I realized that the same fear that kept her from dying had also kept her from living. Holding back? She was a champion. Not quite 23 years old when her husband died in the flu epidemic of 1918, she never got emotionally involved again, preferring to live entirely for and through her only son, warping him like a plastic bottle in a brush-fire. She held back across the entire spectrum, giving nothing of herself to family or friends that really mattered. How else to explain that my father, at 79, has never known his own father's first name? How else to explain that I only learned four years ago (by accident!) that my grandmother has played the harmonica since she was 14 years old? It wasn't that I wasn't paying attention. She just kept it, and unguessable numbers of other things, to herself . . . where no one, now, will ever find them. When she's gone, so will they be. Forever.

So what, you ask? That was her choice, and who am I to judge it?

So this: Do you honestly think we are born for no reason? That life is a thread woven from nothing on one end, and tattered to nothing on the other? I don't. But even if I didn't believe in vaster arenas than this little one that bounds us, I'd have to grant that there was a *chance* that life meant something — and gamble on that chance accordingly. People who hold back are betting against even the odds of odds.

So from here on out I'm not holding back. I will be myself most unabashedly, in all things and all ways, and wish you likewise. Think of all the fun we'll have, giving everything that we can find to give, making room to let in everything we can learn to receive!

That's an artist's life; full to the brim and sloshing over. A life worth having.

The next time my eyes meet a stranger's eyes, I will not look away. I'll leap the gap, making either friend or foe, but I will not look away. I will not give in to the Wrong Thing. Because when I finally stand at the doorway to death my grandmother now faces, I want to stand there not with fear, but with gratitude and simple, honest pride.

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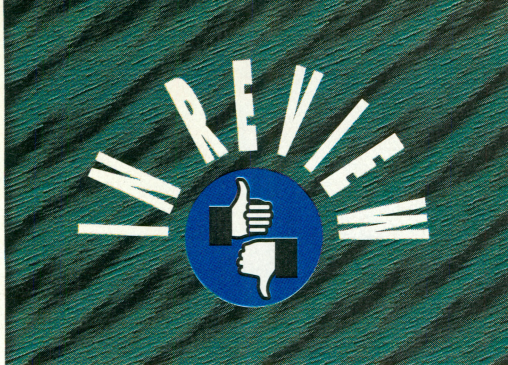
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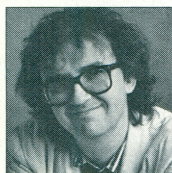
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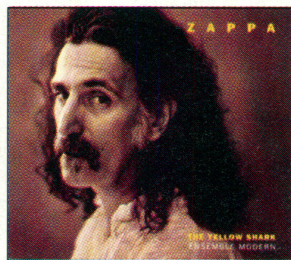
ROBERT L. DOERSCHUK



## RECORDINGS

**Tori Amos, *Under the Pink*** (Atlantic). Listening to this extraordinary music from the keyboard angle is like studying just the blue bits on a Picasso canvas. For Amos, the piano is a contextual tool. Rather than shove her playing out front, she plants it like a seed in the garden of her imagination; melody, arrangement, and all the tendrils of her creativity sprout from and surround each work. These colors, these ephemeral sounds and enigmatic lyrics sung with shattering passion, are what dazzle us at first. But it's the piano that keeps Amos's ideas from whirling out of reach. Her use of the instrument is much more subtle than what we hear from Billy Joel or Elton John, and far more dynamic than anything by self-accompanists of the Randy Newman school. With full orchestra, as on "Yes, Anastasia" and "Pretty Good Year," Amos practically plays a concerto beneath her vocals; she underscores the ensemble's dynamics and flows from arpeggiation to syncopated lines to string-snapping chords, unimpeded by metrical intricacies. But when playing unaccompanied, she can be chillingly simple; the solo piano intro to "Icicle" is as still as an Arctic white night, while "Bells for Her," rendered on an upright piano that was detuned and literally battered into a state of sonic degradation, sustains a dark and breathless beauty for five full minutes. Though she tries a few new tricks, *Under*

*the Pink* is mainly a step further in the direction indicated by her 1992 debut, *Little Earthquakes*. Her talent, already impressive, is apparently just beginning to blossom.



**Frank Zappa, *The Yellow Shark*** (Barking Pumpking, dist. by Rhino).

Although Zappa's legacy spans the (vast? narrow?) chasm from politics to performance art, music was the foundation of his work. This fact, evident though it seems, might be forgotten by those who saw him primarily as either a hero or villain in battles over free speech. But *The Yellow Shark* takes us back to the fundamental truth: For all his unlikely beginnings in proto-grunge L.A. bands, Zappa would reach a plateau occupied only by a handful of innovators. These performances by the Ensemble Modern emphasize the so-called "serious" side of his music. Despite a reliance on certain orchestral devices, including a trombone overblown for vaudeville effect, an impressive compositional breadth and technical mastery is evident here. By alternating atonal or densely poly-

phonic pieces, such as "The Girl in the Magnesium Dress" and the piano duet "Ruth Is Sleeping," with cabaret-influenced works like "Be-Bop Tango" or slapstick *recitatifs* along the lines of "Food Gathering in Post-Industrial America, 1992," the program leads us back to the same questions posed 27 years ago with the release of *Freak Out!*: Can the contradictions between high art, buffoonery, and social commentary be reconciled? More to the point, are such contradictions more illusion than substance? This album suggests that at least in the work of exceptional artists, all borders are insignificant, and all barriers mere material for musical exploration.

**Jonas Hellborg Group, *Jonas Hellborg Group*** (Day Eight, 532 La Guardia Pl., #421, New York, NY 10003).

Bassist Hellborg, drummer Anders Johansson, and keyboardist Jens Johansson enjoy equal time in the spotlight on this raw trio set. Jens does all his work on organ, mainly with Leslie off and minimal changes in registration. The organ's overdriven growl obliterates any soft spots overlooked by his colleagues' thrashing exertions. When played this loud and at these tempos, glitches are embarrassingly audible and solos can stumble over the slightest technical hiccups. But Johansson has the right combination of aggression, imagination, and command to shine in this setting. Nothing trips him up: He and Hellborg devour unison parts with an almost gleeful virtuosity. On his own, Johansson plays with a volatile combination of power and precision: Listening to his solo on "Dog Bar-B-Q" or in the last eight bars of "Mouteadne" is like watching a bull stampede through a house of mirrors. Images of Emerson flash past as tempos hit Mach One, and after it's over Johansson stands unscarred. The new acid jazz label doesn't quite fit here. Rather, Hellborg and company resemble children of a *ménage à trois* involving prog, punk, and old man fusion. With such a lineage, it's no wonder this album sounds so dangerous.

**Ilan Rechtman & Pierre Saint-Denis, *Vivaldi's Revenge: The New Four Seasons*** (Omega Record

Group, 27 W. 72nd St., New York, NY 10023).

There are two ways to rework the classics: You can be faithful to the letter of the score, or you can try to tap into the spirit behind the notes. The latter method is riskier, but it offers bigger payoffs. Rechtman and Saint-Denis follow the second course, butt head-on against traditional views of the piece, and come up smiling. Using Opcode Studio Vision, Digidesign Sound Tools, and Coda Finale to drive a battery of synths and samplers, Rechtman playfully reworks the famous Vivaldi concerto. Sampled krummhorns, recorders, and oboes d'amore dance with contemporary percussion and electronics in swirling patterns behind Saint-Denis's rendition of the untampered flute part. Rhythms effortlessly interweave: The *Allegro* from the third movement, *L'autunno*, evolves from Baroque counterpoint to lounge jazz, with a sly quote from *The Pink Panther* tossed in for extra spice, while harpsichord and guitar samples jam over a samba groove in the *Allegro ma non molto* from *L'inverno*. Rechtman's glistening colors reflect the original orchestration in tasteful modern hues. For all the liberties taken here, one can imagine the composer applauding the results, or even joining in to trade a few fours.



**Vampire Rodents, *Lullaby Land*** (Cargo Records, 4901-96 Morena Blvd., San Diego, CA 92117-3432).

From beneath the sunny skies of Phoenix, Vampire Rodents spew forth a sound that repels and intrigues at the same time. Their timbres, tough as steel on first hearing, are exposed, on closer examination, as a writhing mass of samples, live drums, tortured violin and cello scrapes, and other noises. These elements twine in obsessive repeated patterns behind Jin Laoshu's cym-



bal-free percussion, then veer into different meters and tempos with no warning. We're used to hearing endless repetition in hard core music, so the collision between our expectations and the Rodents' speed-demon twists and turns hits hard and reverberates throughout the album. Synthesist Victor Wulf and "sample orchestrator" Daniel Vahnke stick to the murky side of the sonic spectrum, but within these limits their choice and arrangements of sound are inspired. Swarming bees, giggling kids, dissonant orchestral snatches splattered against an ominous industrial beat, all conspire to paint a picture that's

both frightening in its dark power and impressive in its intricate concept. Listening to *Lullaby Land* is like watching black hurricane clouds billow toward shore, beautiful and terrifying.

**Harvey Bainbridge, *Interstellar Chaos*** (Taste Records, Box 775, London E5 9DE, England).

After 13 years behind the keys as a member of Hawkwind, Bainbridge launches a solo career with this marathon release. *Interstellar Chaos* dishes up 78 minutes of non-stop dense electronics, in which looped and sequenced patterns



struggle for space with layers of synths. There's a European quality to this work: Shortwave bleeps and other radio effects evoke a Kraftwerk aesthetic, while the less abstract pieces, generally set in minor keys, and spacey effects bring

Jean-Michel Jarre to mind. Much of his free-tempo stuff has the flavor of the "weirding out over Jupiter" section of the 2001 soundtrack. Even in his tighter pieces, such as "Cosmic Junk," Bainbridge leaves rough edges. Rather than dice his music into distinct bits, he occasionally lets parts slop over from one section of a piece to the next. This, combined with the generally dark and metallic timbres he prefers, lends a murkiness to his work that, in the context of today's more antiseptic approach, is actually quite appealing. Look for new Bainbridge projects from Taste over the next few months. ■

## FAST FORWARD



**The Band, *Jericho*** (Pyramid, dist. by Rhino). Garth Hudson's coloristic magic enlivens this comeback effort. The Lowrey organ was neglected even in Hudson's heyday; now, in his hands, its quivering timbres seem even more exotic. His piano work is expressive as well, and his accordion fills on "Move to Japan" are downright outrageous. Welcome back a master.

**Kitaro, *Heaven and Earth*** (Geffen). Billowing synth and orchestral episodes alternate with Vietnamese solo and instrumental miniatures in Kitaro's Western soundtrack debut. We've given his albums mixed reviews in the past, but this score to the new Oliver Stone film is as effective as any movie music we've heard in recent months.

**Various Artists, *California Dreaming*** (FFRR, 825 Eighth Ave., New York, NY 10019). Imaginative West Coast techno, featuring Young American Primitive, Tranquility Bass, Hawke, and eight other artists. Sequences coast rather than cut, synths sail rather than slash. Could this be the Rebirth of the Cool?

**Mitch Woods & His Rocket 88's, *Shakin' the Shack*** (Blind Pig). Woods rocks the joint with some of the jumpin'est piano we've heard

since our last all-nighter at the House of Blue Lights. Pass that Thunderbird and turn it up!

**Mint Condition, *From the Mint Factory*** (Perspective, dist. by A&M). Impeccable R&B, marked by lush vocal and keyboard harmonies. Lawrence Waddell gets credit for the latter: His silky solos and thick synth voicings mark him as a talent deserving far greater notice.



**McCoy Tyner, *Journey*** (Verve). Those who have experienced Tyner only in small combo settings should tune into this new release. When teamed with these 14 players, he can unleash his considerable textural powers even more effectively than with trios or quartets. With the horns in tight sync and the rhythm section blowing, this is a *Journey* to remember.

**Clock DVA, *Sign*** (Contempo Intl., dist. by Cargo, 4901 Morena Blvd., Ste. 906, San Diego, CA 92117-3432). Adi Newton and Robert E. Baker weave spare analog synth lines through NASA transmissions, sprinkle spacey effects on top, and shoot the mix into the void of ambient stasis and house rhythms. Imagine Alan Shepard onstage with DAF.

**Sect, *Telekinetic*** (Third Mind/Roadrunner, 225 Lafayette St., Ste. 407, New York, NY 10012). Powerful, if textbook, techno from a young Vancouver trio. Their timbres are unrelievedly grim, but Mike Victory, Bruce Young, and Jason McEvoy get plenty of mileage from careful note selection in their sequences and effective tweezing in their furious drum patterns.

**Earl Hines, *Here Comes Earl "Fatha" Hines/Spontaneous Explorations*** (Red Baron, dist. by Sony). These two reissues, packaged as a double CD set, offer a typical taste of Hines. In trio and solo settings, his sprightly spirit, unexpected bursts of notes over ballad sections, surprising chord substitutions, and relaxed sense of swing suggest a time when innovation wasn't quite as serious a business as it is today.

**Harold Budd, Ruben Garcia, & Daniel Lentz, *Music for 3 Pianos*** (All Saints, dist. by Caroline). Minor arpeggios and whole-note melodies tread in these haunting, slow-motion studies like shadows filing through a dreamscape. Budd's unique piano sound — rock-hard yet muffled beneath a sea of reverb — never sounded so compelling.

**Sue Keller, *Ol' Muddy*** (HV Recording, 177 West End Ave., Brooklyn, NY 11235). A cornucopia of rags, from the inevitable "Maple Leaf" through Keller's own "Cranberry Stomp," all played with technical assurance. The sentimental tremolos and excessive rubato may sound hokey by modern standards, but old-timers from the pre-Joshua Rifkin era would probably call Keller's style authentic. ■



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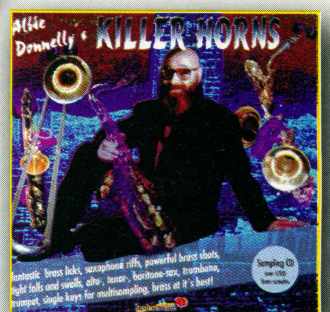


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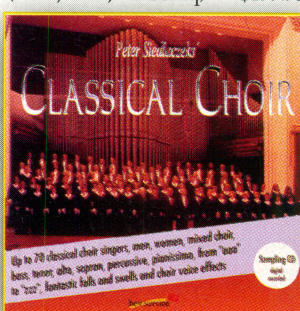


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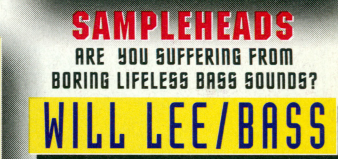


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# BANG THE DRUM

Creating Hooks on Rhythm Machines

**If** you ask a few of your friends to name their ten all-time-favorite musical hooks, you're certain to get a slew of different answers. Keyboard players may tend to identify with hooks that involve a keyboard part (perhaps the octave portamenti played by Keith Emerson in "Lucky Man"). Drummers might include Steve Gadd's military-based groove in "Fifty Ways to Leave Your Lover." And guitar players might point to that screaming solo in "Thriller." The point is that everyone has a different idea of what makes a great hook. ● Perhaps the easiest way to describe a good hook is to think of that special something that makes a song memorable even after the very first hearing. Many

By Norm Weinberg

Illustration: Eric Thomason



# BANG THE DRUM

songwriters have a special gift for creating million-selling hooks. It's easy to create a list of possible musical ingredients that can be made into a hook (as you read this list, use your mind's ear to listen to a favorite tune that uses each hook idea):

**Lyrics:** A super catchy or clever lyric (during the verse or especially during the chorus) has often been enough to create the hook for a tune.

**Melody:** Occasionally, a good writer will compose a melody that is so strong, the listener is singing it for the rest of the day.

**Harmony:** Perhaps the harmony to the chorus is unique, imaginative, or daring enough to raise the hair on the back of

the listener's neck.

**The Hot Solo:** It could be played by a keyboard, guitar, sax, or even harmonica, but the solo is just so burnin' that you've just got to hear the tune again!

While it is certainly possible for a song to sell itself on the basis of a single hook or great idea, you'll have a better chance to reach the "hit" factor if your creation has two or more strong hooks. The very best composers and songwriters often have several hooks in the same song. Perhaps they've joined a strong melody with a great lyric and placed it within a heart-stopping chord progression.

The drums are all too often overlooked when it comes to creating the hook. The self-imposed requirement of punching two and four on the snare can often stifle creative hooks in the percussion parts. With a little thought and extra effort, though, the drums can become a major contribution to the hook factor of a song. Below are just some of the musical building blocks that can create a hook in the drum and/or percussion tracks of your song. Since many of these ideas are interrelated, consider combining one or more of them in your next track.

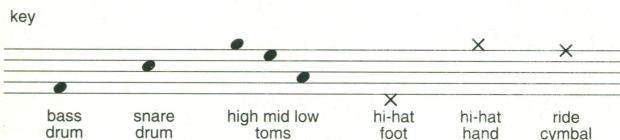
**Sound.** A unique sound can easily act as a hook. Just as you sweat and toil over pro-

gramming special patches on your favorite synth, creating your own drum sounds will give your composition that special flavor. With all the sample-editing software on the market, not to mention the thousands of drum sounds and loops available on CD, you can custom-design a unique color for the bass drum, snare drum, toms, or any of the cymbals. One of my favorite bass drum sounds was created by mixing, cutting, pasting, and reversing the sounds of two different bass drums, a floor tom, and a gunshot.

An easier method of custom designing drum sounds is to layer different percussion

## ABOUT THE AUTHOR

*Norm Weinberg teaches percussion and electronic music at Del Mar College in Corpus Christi, Texas. His latest project is establishing the World Percussion Network (a BBS dedicated to percussion) for the Percussive Arts Society. For more info about the WPN, write to Norm at 4617 Sheffield, Corpus Christi, TX 78411.*



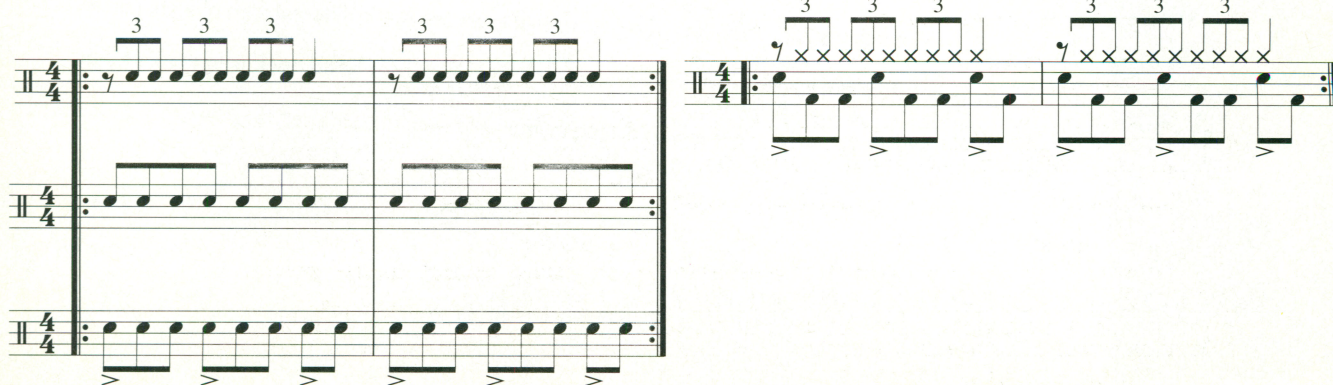
Ex. 1a. Typical Ghanaian rhythm, played by two different instruments.

Ex. 1b. Ghanaian rhythm of Example 1a revoiced for drum set.



Ex. 2a. Ikoro slit-drum rhythm from Nigeria.

Ex. 2b. Ikoro rhythm from Example 2a revoiced for drum set.





together. Now that so many percussion sound generators are capable of layering multiple sounds, you can create that “fat-back” snare drum sound by layering five or six different snare colors. You might wish to create your hook sound by layering different instruments that are complementary or even contrasting in nature.

If you prefer, you can decide to break the bonds of tradition and replace the established drum set sounds with other percussion instruments that can easily take their place. Here are just a few examples: Instead of the normal drum set bass drum, try a concert bass drum, a surdo, timpani, gunfire samples, or a sample of your fist hitting a large suspended sheet of drywall. A snare drum can be replaced with a taiko drum, iron pipe, bongo,

or tambourine (now extremely common). Try a triangle or angklungs in place of a hi-hat, or use timpani for tom-toms. Try a substitution so weird no one has ever thought of it before, and see what happens.

Don't forget that using audio effects can help create a distinctive sound. Sure, everyone knows about passing the drums through some EQ or adding a little echo and reverb, but some very cool drum sounds can be created by sending them through one or more of the myriad “stomp boxes” that guitar players use every day. Try phase-shifting the cymbals, adding some wah-wah to the toms and bass drum, or passing the snare drum through a ring modulator.

**Style & Groove.** While we're on the subject of substituting or designing new sounds,

you can create a unique groove by using both the indigenous percussion instruments and the idiomatic musical styles of various countries and peoples. Paul Simon created the hooks for several tunes by using the musical styles and instruments of South Africa and Brazil. But some other musical heritages have yet to be blended with our Western pop music styles. There are some fantastic percussion instruments and musical styles in Korea, Syria, Ghana, and India. (See Examples 1 and 2.)

There are even some styles right here in the good ol' U.S. of A. that are not explored as much as they might be. The “second-line” drumming style of New Orleans is common in music by such artists as Dr. John or the Meters, but few composers have created a fusion combining second-line drumming with styles

Ex. 3. Second-line drumming style; program this with a shuffle feel similar to that in the tune “Iko-Iko” (by James Crawford).



Ex. 4. Second-line drumming style; the use of flams gives a strong marching feeling.



Ex. 5a. Rudiment-style drumming.



Ex. 5b. Rudimental pattern from Example 5a revoiced for drum set. There are hundreds of ways to revoice this pattern.



Ex. 6. Examples of text painting with drum set.





# BANG THE DRUM

outside of this geographic area. (See Examples 3 and 4.)

If you take the traditional snare drum rudiments and apply the rhythms and stickings to the drum kit, you can arrive at something new and useful — the sticking may help determine which instruments play at any particular time. (See Example 5.) Another style blend could be to unite a 4/4 rock pattern with a 12/8 blues groove.

**Text Painting.** Text painting is a simple concept: Use the instrumental parts to help illustrate the meaning of the lyrics. While this tried-and-true technique has been around for centuries, most composers think of text painting as purely a melodic or harmonic

device. Why not apply the same technique to the drum and percussion parts as well?

For example, if the lyrics mention running, you might briefly switch to a sixteenth-note passage on the hi-hat, so that the drums imitate the busy physical activity of running. You could program the drums to observe a rest for a short time near the lyric "stop." If the lyrics indicate a movement upward (high, loud, bright, etc.) a fill can ascend through the various pitches of the drum set. If you use your imagination, many descriptive lyrics can be creatively imitated on various percussion instruments. (See Example 6.)

In addition to painting specific words of the text, you can paint a picture of the mood of the music with percussion. If your musical creation concerns saving the planet by efficient use of our natural resources, you could texture the background with wooden instruments that evoke the sounds, textures, and feelings of a tropical forest (a rain stick, wooden pod rattles, caxixi, guiro, log drums, stamping tubes, etc.). A tune that evokes the feeling of a sunny Saturday atop an apartment in New York City might make use of fingersnaps, thigh slaps, and other human percussion sounds.

**Nothing at All.** One of the most effective methods of using drums to stir up the hook

of a tune is to leave out one or more of the traditional instruments that make up the drum set. For example, try programming a song without using any cymbals. As mentioned earlier, you might use another percussion instrument to replace the parts that the cymbals might play, or you can even leave the instrument's function completely out of the picture. I remember listening to a recording that had Bill Bruford playing drums, thinking, "There are no cymbals on this track, how cool!" I wasn't aware of this fact until the third time I heard the song. I knew unconsciously that there were many interesting things about the composition, but I wasn't immediately aware that the cymbals were missing. It certainly gave the song a special flavor and character.

You might try leaving the drums totally out for a bar, a section, or even the entire tune, especially when drums might overpower an otherwise great hook in another part. Listen to Elton John's "That's Why They Call It the Blues" and notice the structure of the chorus — an eight-bar phrase with a one-bar extension. During the extension, the drums just continue the basic beat. Most drummers would use this opportunity to play a powerful fill back into the verse. Less is sometimes more. ■

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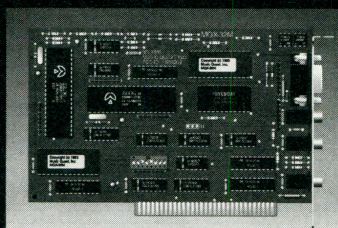


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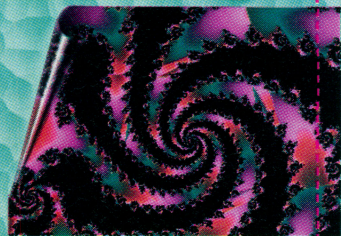
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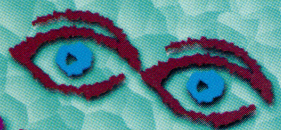
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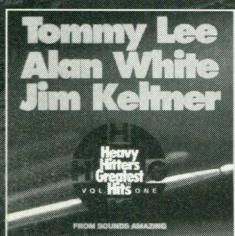
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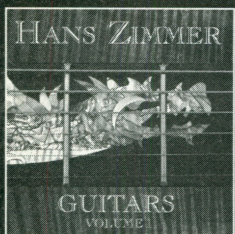
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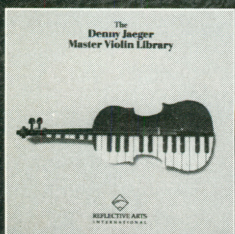
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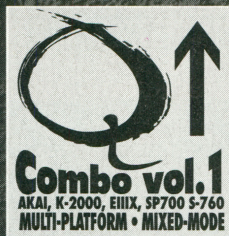


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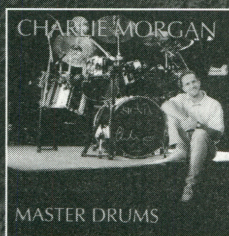
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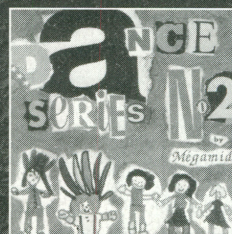
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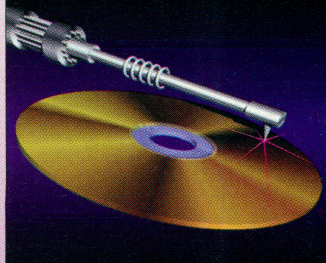
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grated our remarkable synthesis, waveform and sequencing technologies into a single unit that provides unrivalled

**If I'd known  
about this,  
I would have  
cut off my  
nose instead.**

Being the visual person he obviously was, Vincent Van Gogh would have instantly appreciated the new JV-1000. Because unlike so many instruments that look exactly like so many other instruments, this particular synthesizer workstation looks unlike anything you've ever seen before. And as you'll learn in a moment, it also performs unlike anything you've seen before. But, we're getting ahead of ourselves.

See the LCD display? The one on the left or the one on the right, you ask? And that's the point, because the new Roland JV-1000 actually has two of them—one for the synthesizer and one for the sequencer.

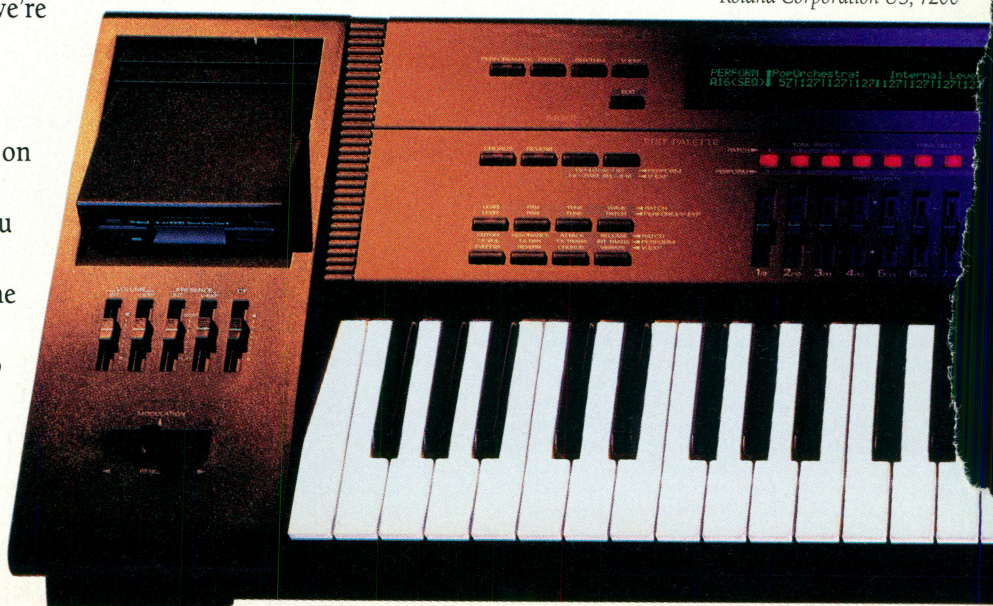
With the JV-1000 we've inte-

music production and performance capabilities along with a 76-note keyboard.

The synthesizer section has 4Mbyte of ROM waveforms, which encompass everything from breathtaking acoustic instruments to dynamic synthesizer textures to an extraordinary array of drum and percussion sounds.

And if you'd like to expand the waveform memory

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If you wish, you can also take advantage of a user-installable Roland VE-GS1-01 Expansion Board and in the process, add a complete GS synthesizer module. You'll be rewarded with 226 sampled sounds, drum kits and digital effects, as well as an additional 28 voices of polyphony and 16 part multi-timbral capability—giving you an extraordinary 56 voices of polyphony and 24 part multi-timbral performance literally at your fingertips.

The sequencer on the JV is our widely acclaimed Super MRC with eight tracks, each of which has 16 channels. A staggering array of editing capabilities gives you easy access to every event on every track.

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The 76-note keyboard is both velocity- and after-touch-sensitive. It's capable of controlling up to eight external MIDI channels simultaneously, each with its own independent key zone and volume, panning, velocity curve and program change.

You'll find eight control sliders on the front panel which can be used either for editing sounds, for mixing volume and panning on sequenced tracks, or even for external MIDI control. Consequently, the JV-1000 works beautifully as a MIDI master keyboard.

By now you no doubt appreciate that the new Roland JV-1000 is a truly remarkable workstation. All that's left is to play one at your music store. You'll appreciate your ears as never before.

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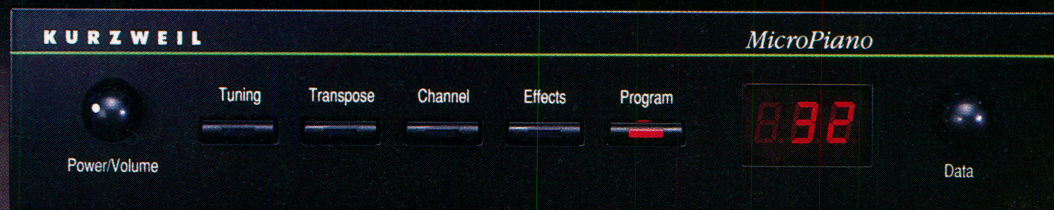
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Presets including Kurzweil's new  
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# MAC ATTACK

WITH OVER  
50 MODELS  
TO CHOOSE  
FROM,  
PICKING  
AN APPLE  
ISN'T AS  
EASY AS IT  
USED TO BE



IN 1984

you could buy exactly one model of the Macintosh computer. It came with 128Kb of RAM (not expandable) and two applications:

MacWrite and MacPaint. In 1985 you had your choice of two **BY CARTER SCHOLZ** models: the original and a 512Kb version. From 1986 through 1989 Apple released about two new Macs a year. At the end of 1990 it was still possible to cover all of

**ILLUSTRATION: JOHN BLACKFORD**



# MAC ATTACK

Apple's new machines for the year — four of them — in a short *Keyboard* column. Total Mac models to that date: 15.

Since then, Apple has introduced six new lines of Macs — Quadra, Performa, PowerBook, Duo, Centris, and Workgroup — for a total of 50 new models in three years, a number almost certain to be surpassed by the time you read this.

No wonder even veteran Apple-watchers

have begun to twitch and mutter in their sleep. Those of you who are wondering whether to buy, wait, upgrade, sidegrade, or just go back to the kazoo and the quill are referred to page 39, where you'll find a complete chart of all Mac models and their major features, from 1984 to 1994. The chart may not make deciding what to do any easier, but at least you'll see why you're confused.

## CURRENT MACS

Of the compact-size Macs, only the Classic II and the Color Classic are still around. Either is fine for MIDI, but the only digital audio option available is Digidesign's Audiomedia LC card with the Color Classic.

The Macintosh II desktop line, so long an Apple mainstay, is virtually gone, the Ilvx being its only remnant. It's been superseded by the Quadra and Centris lines, both based on 68040 processors. No one is quite sure why these two new lines were ever separate, and as of October 1993 they no longer are: The Centris is history. Its three models (610, 650, and 660AV) continue life as Quadas.

## MACINTOSH REPACKAGINGS

Performa 200 = Classic II  
Performa 400, 405, 410, 430 = LC II  
Performa 450, 460 series = LC III  
Performa 470 series = LC III with 68040  
Performa 550 = LC 520 (33 MHz)  
Performa 600 = Ilvx  
Workgroup 60 = Centris 610  
Workgroup 80 = Quadra 800  
Workgroup 95 = Quadra 950

Note: These are not exact equivalents. Base configurations, processor speeds, and cases may vary.

## NEWEST OF THE NEW

On October 21, 1993, Apple announced seven new computers. The Quadra 605, 610, and 650 replace the Centris 610 and 650, with improved performance. The 610 (8Mb/160Mb HD, \$1,439) features a 25MHz 68040 and built-in Ethernet. The 650 (8Mb/230Mb HD, \$2,399) is a 33MHz 68040 with three NuBus slots. The 605 (4Mb/80Mb HD, \$969) is a 25MHz 68LC040.

The Duo 250 (4Mb/200Mb HD, \$2,599) is an active-matrix grayscale portable, and the 270c (4Mb/240Mb HD, \$3,099) is the first 16-bit color active-matrix portable. Duo 210 and 230 owners can upgrade to either the 250 (\$1,299) or the 270c (\$1,999).

Three new Performa lines, starting at \$999, are the 460, 470, and 550. The 550 sports a built-in CD-ROM drive, stereo sound, and a Sony Trinitron monitor. Several models in each line, with various hard disk and memory configurations, will be available.

The LC 475 is a 68040-based modular computer, priced for the educational market at \$1,082.

System 7 Pro is the latest system release from Apple; it includes the standard System 7.1, along with Quicktime 1.6.1, AppleScript 1.0, and PowerTalk 1.0. It requires a minimum of 5Mb RAM, and is happier with 8Mb — don't forget to add enough RAM for applications.

These are extremely capable machines and will continue as the flagship Apple line for at least a month or two. (Just kidding. I think. See "PowerPC" below.)

The LC line is sold to educational markets. Based on 68030 processors (except the original 68020-based LC), they're fine for MIDI, but they lack NuBus slots, so digital audio options are limited to Digidesign's Audio-

## MIDI PROBLEMS

Music users have never been a high priority for Apple. From the beginning, MIDI developers have had to write low-level code for getting data over the Mac's serial ports. Apple's MIDI Manager was supposed to provide a standard method of MIDI communication, but it proved to be too slow on many machines (as well as somewhat flaky), and Apple was dilatory about upgrades.

Opcode's OMS addressed many of MIDI Manager's shortcomings, but the PowerBooks introduced a new type of problem. Essentially, the Power Manager periodically blanks the serial ports, resulting in the potential loss of incoming MIDI data. OMS versions 1.2 and later correct this problem on the modem port, but the printer port remains unreliable. This could be a particular problem for SMPTE users, since it's usual to dedicate the printer port to SMPTE, leaving the modem port for MIDI. Putting both timing information and performance data on the modem port could push the limits of MIDI's bandwidth. Apple's new MIDI Manager 2.0.2 reportedly implements the same PowerBook fix as OMS 1.2.

The PowerBook 100 has a different architecture, as it only has a printer port. It's reliable at normal MIDI speeds, but may lose data with high-speed interfaces. A software patch is necessary to keep the serial port "awake" with some MIDI applications. (One fixit patch is "Serial Fix," by Stenograph Legal Services, available on some BBSes.)

Opcode is now in the unenviable position of playing catch-up with the flood of new Macintosh models. There are still some unresolved software problems with PowerBook models 165c and 180c. In addition to software glitches, some hardware interfaces are problematic; Opcode's Studio 3 doesn't get along with Duos, though Opcode is working on a fix. Our advice is to call Opcode (not Apple) for the latest interface compatibility info.

The Ilfx and Quadra 900/950 need Apple's Serial Switch software patch to work properly with MIDI applications. The Ilvx, Ilvi, and some Performas require the appropriate System Enablers to fix some MIDI problems. And, of course, it's always preferable, and sometimes necessary, to turn off AppleTalk when using MIDI.



The first column is the model name. The second shows the Motorola processor type, its operating speed in MHz, and whether or not it has a math chip. The third column indicates the maximum amount of RAM (megabytes) than can be installed. The fourth column shows the ROM size (kilobytes or megabytes). Column five is the number of expansion slots (NuBus/PDS; 1/1 means there is one slot that requires either a NuBus or a PDS adapter). The sixth column shows system software requirements. The seventh gives video capabilities, and the last shows when a model was introduced and discontinued. Floppy drives: All models after 8/89 have 1.4Mb drives. Screens: 9" = 512x342 pixels, 13" = 512x384, 14" = 640x480, 16" = 832x624, 21" = 1152x870. \* indicates a new model (10/21/93). † indicates a single slot that may be adapted for either NuBus or PDS use.

## MACINTOSH COMPUTER MODELS, 1984 TO PRESENT

MODEL	CPU/CLOCK/FPU	MAX RAM	ROM	NU/PDS	SYSTEM	MAXIMUM VIDEO	LIFETIME
<b>— COMPACT</b>							
Mac 128	68000/8/N	128K	64K	0/0	0.1-2.0	built-in b&w 9"	1/84-4/86
512	68000/8/N	512K	64K	0/0	0.3-3.2	built-in b&w 9"	10/84-4/86
512KE	68000/8/N	1Mb	128K	0/0	0.7-	built-in b&w 9"	4/86-3/87
Plus	68000/8/N	4Mb	128K	0/0	3.0-	built-in b&w 9"	1/86-10/90
SE	68000/8/N	4Mb	256K	0/1	4.0-	built-in b&w 9"	3/87-10/90
SE/30	68030/16/Y	128Mb	256K	0/1	6.0.3-	built-in b&w 9"	1/89-10/91
Classic	68000/8/N	4Mb	512K	0/0	6.0.6-	built-in b&w 9"	10/90-9/92
Classic II	68030/16/opt	10Mb	512K	0/0	7.0.1-	built-in b&w 9"	10/91-
Color Classic	68030/16/opt	10Mb	1Mb	0/1	7.1-	built-in 8-bit col 9"	2/93-
<b>— DESKTOP</b>							
II	68020/16/Y	68Mb	256K	6/0	4.0-	4-bit 14"	3/87-1/90
IIx	68030/16/Y	128Mb	256K	6/0	6.0.2-	4-bit 14"	9/88-10/90
IIcx	68030/16/Y	128Mb	256K	3/0	6.0.3-	n/a	3/89-10/90
IIci	68030/25/Y	128Mb	512K	3/0	6.0.4-	8-bit 14"	9/89-2/93
IIfx	68030/40/Y	128Mb	512K	6/0	6.0.5-	8-bit 14"	3/90-10/91
IIsi	68030/25/opt	68Mb	512K	1/1†	6.0.6-	8-bit 14"	10/90-2/93
IIvi	68030/16/Y	68Mb	1Mb	3/0	7.1-	16-bit 13"	10/92-3/93
IIvx	68030/32/Y	68Mb	1Mb	3/0	7.1-	16-bit 13"	10/92-
<b>— EDUCATIONAL</b>							
LC	68020/16/N	10Mb	512K	0/1	6.0.6-	8-bit 13"	10/90-6/92
LCII	68030/16/N	10Mb	512K	0/1	7.0.1-	8-bit 14"	3/92-
LCIII	68030/25/opt	36Mb	1Mb	0/1	7.1-	16-bit 14"	2/93-
*LC475	68030/25/opt	36Mb	1Mb	0/1	7.1-	16-bit 16", 8-bit 21"	10/93-
LC520	68030/25/opt	36Mb	1Mb	0/1	7.1-	built-in 8-bit 14"	6/93-
<b>— DESKTOP/TOWER</b>							
Centris 610	68040/20/opt	68Mb	1Mb	1/1†	7.1-	8-bit 21", 16-bit max	2/93-
650	68040/25/opt	136Mb	1Mb	3/1	7.1-	8-bit 21", 16-bit max	2/93-
660AV	68040/25/Y+DSP	68Mb	1Mb	3/1	7.1-	8-bit 21", 16-bit max	8/93-
Quadra 700	68040/25/Y	68Mb	1Mb	2/1	7.0.1-	8-bit 21", 24-bit max	10/91-2/93
*605	68040/25/opt	68Mb	1Mb	0/1	7.1-	16-bit 16", 8-bit 21"	10/93-
*610	68040/25/opt	68Mb	1Mb	1/1†	7.1-	16-bit 16", 8-bit 21"	10/93-
*650	68040/33/Y	136Mb	1Mb	3/1	7.1-	16-bit 16", 8-bit 21"	10/93-
800	68040/33/Y	136Mb	1Mb	3/1	7.1-	8-bit 21", 16-bit max	2/93-
840AV	68040/40/Y+DSP	128Mb	1Mb	3/1	7.1-	8-bit 21", 24-bit max	8/93-
900	68040/25/Y	256Mb	1Mb	5/1	7.0.1-	8-bit 21", 24-bit max	10/91-7/92
950	68040/33/Y	256Mb	1Mb	3/1	7.0.1-	8-bit 21", 24-bit max	5/92-
<b>— PORTABLE</b>							
Portable	68000/16/N	9Mb	256K	0/1	6.0.4-	b&w	9/89-10/91
PowerBook 100	68000/16/N	8Mb	256K	0/0	6.0.8-	b&w	10/91-8/92
140	68030/16/N	8Mb	1Mb	0/0	7.0.1-	b&w	10/91-8/92
145	68030/25/N	8Mb	1Mb	0/0	7.0.1-	b&w	8/92-6/93
145b	68030/25/N	8Mb	1Mb	0/0	7.0.1-	b&w	6/93-
160	68030/25/N	14Mb	1Mb	0/0	7.1-	gray, ext. col	10/92-
*165	68030/33/N	14Mb	1Mb	0/0	7.1-	gray, ext. col	10/93-
165c	68030/33/Y	14Mb	1Mb	0/0	7.1-	col (& ext.)	2/93-
170	68030/25/Y	8Mb	1Mb	0/0	7.0.1-	active b&w	10/91-10/92
180	68030/33/Y	14Mb	1Mb	0/0	7.1-	act. gray, ext. col.	10/92-
180c	68030/33/Y	14Mb	1Mb	0/0	7.1-	act. col. (& ext.)	6/93-
Duo 210	68030/25/N	24Mb	1Mb	0/0	7.1-	b&w	10/92-
230	68030/33/N	24Mb	1Mb	0/0	7.1-	b&w	10/92-
*250	68030/33/N	24Mb	1Mb	0/0	7.1-	act. gray, ext. col.	10/93-
*270c	68030/33/Y	32Mb	1Mb	0/0	7.1-	act. 16-bit col.	10/93-



# MAC ATTACK

media LC. The LC 520 adds a CD-ROM drive and a built-in 14-inch color monitor.

PowerBooks have been Apple's most recent success. Unlike the earlier, disastrous "Portable," these notebook computers are powerful, light, usable machines. All have internal hard drives, and all but the model 100 have an internal floppy. Screens are black-and-white, 16-level grayscale, or 8-bit color, either active- or passive-matrix. The active-matrix displays are crisper and easier to read (and more expensive), though the backlit passive displays aren't at all shabby. Some models (160, 165, 165C, 180, 180C, 250, 270C) can drive an external 16-inch color monitor. The only complaint most users have about the PowerBooks is that the batteries don't last long enough.

The Duos are PowerBooks stripped to the bone — one serial port, no ADB ports, no SCSI ports, no floppy drive. They're not usable, alone, as your only computer. For one thing, there's no way to load software onto the hard disk, except over AppleTalk from another

## USED OPTIONS

One benefit of this mad model-changing is that used and discontinued models are available at bargain prices. Here's a brief guide for MIDI shoppers:

Among compact Macs, anything older than a Mac Plus is unusable with most current software. The Mac Plus, SE, and Classic are marginal; their 8MHz 68000 processors are slow, and you can't add more than 4Mb of RAM. The Classic II (or the SE/30) is a good choice for MIDI. None of the compacts will work for digital audio, unless you can find a discontinued Digidesign Sound Accelerator for the SE/30, or an Audiomedia LC for a Color Classic.

The II series remain excellent workhorses for MIDI or digital audio. From slower to faster, the II, IIx, IIsi, IIcx, IIci, and IIfx are fine, though the IIfx needs some pampering (see "MIDI Problems"), and the II's 68020 may be too sluggish for some applications. The LCs are fine for MIDI, but lack NuBus slots; they'll handle digital audio with an Audiomedia LC.

All PowerBooks are basically fine for MIDI applications, albeit with a little tinkering (see "MIDI Problems"). Duos with a Dock can take NuBus digital audio cards.

Mac. The Duo's other half is the Duo Dock, which provides two serial ports, ADB port, SCSI port, video out (8-bit color, expandable to 16-bit), two NuBus slots, optional math chip, LocalTalk and optional EtherNet networking, and a floppy drive. The NuBus slots open the door to digital audio; Digidesign's Pro Tools Audiocard, SampleCell II, Sound Accelerator II, or Audiomedia II will run in

them. Note that the Duo must be closed for insertion into the dock, meaning you must connect an external monitor and keyboard to the dock. Duo, Dock, keyboard, and monitor together add up to an expensive system. A simpler mating option is the MiniDock, with no NuBus, two serial ports, ADB port, video out (8-bit color), LocalTalk networking, and sound in and out. Finally, the Duo Floppy

## ADVENTURES



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# MAC ATTACK

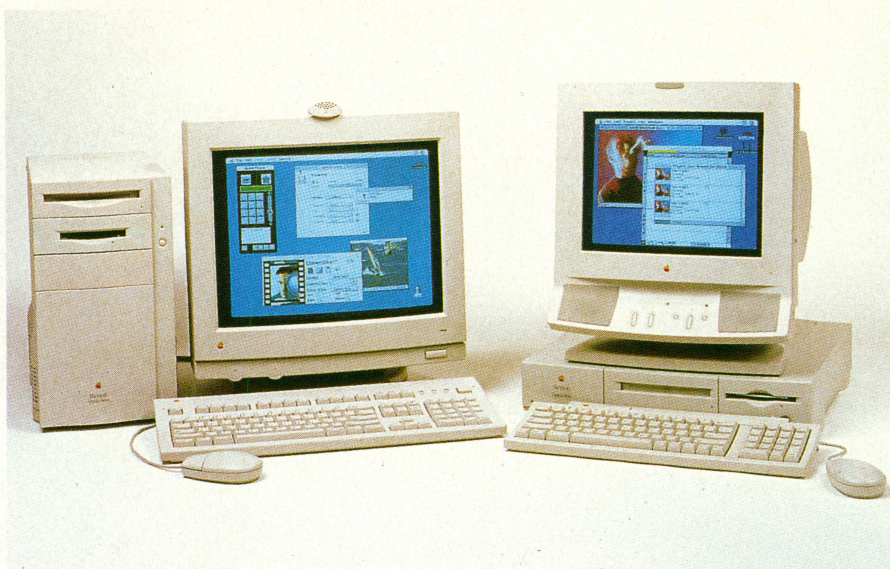
Adapter is the cheapest way to turn a Duo into a functional system, providing an external floppy port and an ADB port.

## THE REMARKETING VARIATIONS

The Performa line is apparently Apple's bid to confuse shoppers by repackaging existing computers with minor changes and selling them in outlets like Sears and Circuit City. The Performa 200 is a repackaged Classic II, the 400 an LC II, the 450 an LC III, and the 600 a Ilvx. Just to complicate things further, MacWeek reports that Apple will sell its new Performa models only to certain retailers: so Price Club gets the 466 and 476, Circuit City gets the 460 and 476, and Sears gets the 460, 475, and 550. There's no reason to buy a Performa unless you really like Price Club's customer support.

The Workgroup Server line (60, 80, 95) are relabeled Quadras with some additional software and hardware directed to networking and fileserving.

**AV.** For music users, the most intriguing



The built-in 16-bit audio capabilities of the Quadra 840 AV (left) and 660 AV are intriguing for musicians, but Apple is far more interested in telecommunication, photo and video processing, and voice recognition than digital audio. The future of the like is uncertain.

new Macs are the AVs (for audio-visual). In addition to a hot 68040 processor, they include built-in 16-bit audio. The Centris 660AV sports an AT&T 3210 DSP chip running at 55MHz. The Quadra 840AV runs a 66MHz AT&T 3210.

Does this mean hard disk recording for the rest of us? Maybe. The audio specs are good, but not up to external systems like Pro Tools: Signal-to-noise is about 85dB and there's no digital I/O. Audio software is on the way; OSC supports the AV's onboard DSP

PHOTO: JOHN GREENE/COURTESY APPLE COMPUTER, INC.

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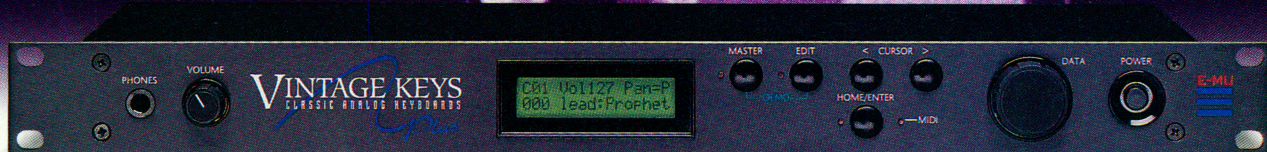
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# MAC ATTACK

with Deck II. Plans are in the works for similar support from Opcode with Studio Vision, Mark of the Unicorn with Digital Performer, and Steinberg/Jones with Cubase.

Apple is clearly more interested in using the DSPs for telecommunication (software emulation of fax/modems, etc.), number crunching (photo and video processing), and voice recognition and synthesis (Apple's new PlainTalk) rather than for digital audio. It seems likely that the 3210 chip will be

dropped in favor of direct DSP processing by the RISC chip in Apple's future PowerPCs. This shouldn't matter, because Apple's new Sound Manager 3.0, which drives the 3210 chip, should support any future audio hardware. But Apple's support for both Sound Manager and MIDI Manager in the past has been poor. Will third parties continue to fix Apple's broken promises?

As for the future of the AV line, rumors are rampant. At press time, most gossipmongers were recounting negative tales. Whatever happened to the slogan, "Keep the faith?" Guess it must have run smack dab into the computer generation.

**PowerPC.** Due for imminent release

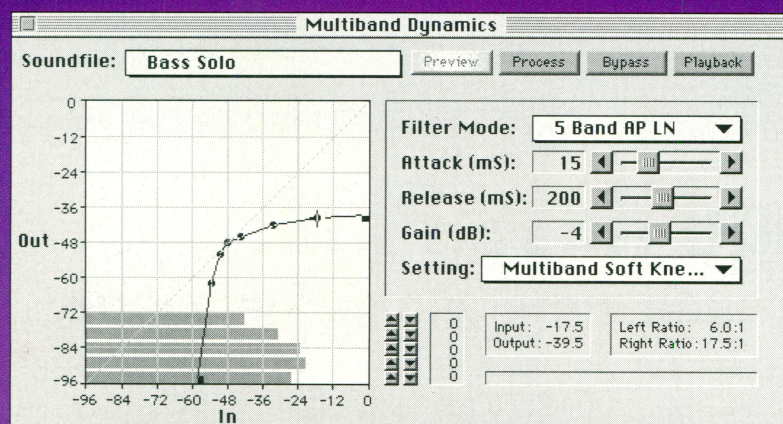
is the PowerPC, a joint IBM/Apple venture. The PowerPCs will be based on a series of Motorola RISC chips, at first the MPC601, 603, 604, and 620. Existing Mac applications will run on a ROM-based 68040 emulator. Motorola is allegedly porting Windows NT to the PowerPC chips, so it's possible that the same machine could run both Mac and Windows software. This would consolidate an industry trend toward platform-independent software. If all goes as planned, chips like those in the PowerPC will let a user choose hardware, operating system, and applications more or less independently.

Apple has run preliminary tests on over 600 Mac applications. Over 90% of them ran unchanged on the PowerPC. Apple claims that hardware and low-level software drivers (such as MIDI) will continue to work as before, and preliminary tests by Opcode seem to bear this out.

PowerPCs and 68020-40 Macs will coexist for a while, but Apple plans to shift completely to the RISC chips over the next few years. Theoretically, a user should notice no real difference except an improvement in performance as developers update software to take advantage of the PowerPCs specific features.

Apple is offering an upgrade path to the PowerPC for certain models — the Centris/Quadra 610, 650, 660AV, 800, 840AV, and Workgroup models. This list may come as a shock to owners of high-end Quadra 700, 900, and 950s. Take heart: Even when Apple upgrades arrive as promised, they're costly.

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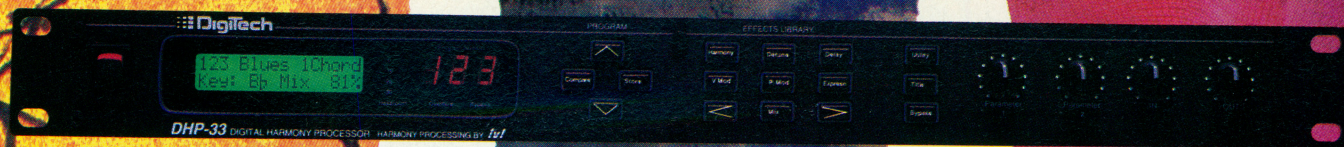
Machines released since October 1992 require System 7.1 and various System Enablers — software patches, distributed on floppies or on-line services, that let Apple fix problems on specific machines without releasing a new System version.

System Enabler Collection 1.0 is a single floppy disk containing all System Enabler files through May 1993. It affects Duo 210, 230, PB 160, 180, 165C, Ilvx, Ilvi, Color Classic, LC III, Quadra 800, Centris 610, 650, and various Performas. Among other things, the Enabler fixes reported MIDI bugs on the Ilvx and some Performas.

As of October 1993, the latest is System Update 2.0.1 (includes Hardware System Update 2.0, Software Utility Update 1.0, and enhancements) for System 7.1 and System 7 Pro. Call 800-769-APPLE to make sure your System is properly Enabled.

*Carter Scholz is a freelance writer and frequent contributor to Keyboard.*





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Right now, professionals are using the CR-1604 to track and mix network TV show soundtracks, feature movies, major label compact discs, 6-channel digital OmniMax<sup>TM</sup> films and TV commercials for Fortune 500 companies. They all use multi-track digital recorders. And they all swear by the sonic quality of the CR-1604.

**NEED MORE info?** Call toll-free for our new 12-page color Applications Guide and 20-page In Your Face product journal. It covers the Mackie CR-1604 mixing system... including OTTO-1604 MIDI automation that brings ultimate control, creativity and consistency to mixdowns. Need audible proof of the CR-1604's sonic quality and versatility in multi-track recording applications? Mail us a money order<sup>2</sup> for \$793 (our cost including shipping) and we'll send you a compact disc with the winners of our Mixed on a Mackie Contest. Eighteen of the songs were mixed with multi-track decks and CR-1604s. You'll hear why the CR-1604 is truly a complete mixer for demanding, professional multi-channel recording work.

LOS LOBOS recently completed the stereo soundtrack for HBO/Showtime's feature film "The Wrong Man" using two Mackie CR-1604s, a MixerMixer combiner and two 8-trk digital recorders just like this one.

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**RECORD** up to eight mic or line inputs simultaneously. TRIM matches any signal from mic to line to instrument levels (even low ones like older keyboards).

**AUTOMATE**, record, recall and finetune complex mixes with OTTO-1604 MIDI Automation upgrade. OTTO installs easily inside any CR-1604. Works with any PC, Atari<sup>®</sup>, Macintosh<sup>®</sup> or Amiga<sup>®</sup> sequencer that supports mixer maps. Rave-reviewed by major mags!

**OUR FREE 12-pg. Applications Guide** includes a more detailed version of this hook-up...plus overdub/bounce, stereo & mono PA applications. Don't enter your bathroom without it!

Mix down from multi-track digital to 2-track without repatching. CR-1604's **SOLO/MONITOR** feature lets you accurately monitor levels anywhere — inputs, AUXs, tape returns, etc.

**CR-1604 MAIN BUS INSERTS** allow final processing of your mixdown onto 2-trk. without repatching.

**RETURN** to monitor and mix recorder tracks 1-8 back into the CR-1604 via Input Chs. 9-16.

**BECAUSE** recorder play-back returns through CR-1604 channels, you can create custom headphone or monitor mixes with 3-band equalization and reverb, etc.

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# PC POWER SHOPPING



## WHAT'S THE BEST IBM SYSTEM FOR YOUR MIDI STUDIO?

### SHOPPING

for a new PC for your MIDI studio? The good news is that cutthroat competition among computer and hard drive manufacturers means you'll get more for your money than ever before. Only a year or so ago, the basic entry-level Windows PC was a 386 with a 120Mb hard drive. Today, the same money will buy you a 486 with a 250Mb hard drive — twice the speed,

**BY ROBERT LAURISTON**

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# PC POWER SHOPPING

twice the storage. Video boards, laser printers, CD-ROM drives, and other add-ons boast similar price/performance improvements.

The bad news is that a slew of new technologies is presenting PC buyers with an ever-more-confusing array of choices. Intel's 486 is getting competition from clones from Cyrix, AMD, and IBM, RISC CPUs such as the PowerPC, and Intel's own Pentium. New systems use two incompatible types of memory chips. The once-universal AT expansion slot has four rivals. And the salesperson at the computer store probably doesn't understand all of this any better than you do.

Luckily, from the MIDI user's perspective, a lot of these choices are pretty simple. Here's a guide to the things you should consider when selecting and configuring your new PC.

## CPU's & CPU UPGRADES

The speed of your CPU is the single most important factor in the overall speed of your PC. Be aware that due to variations in chip design, comparing clock speeds can be misleading. Notably, a 33MHz 486 is almost twice as fast as a 33MHz 386DX; a 66MHz IBM 486SLC2 is slower than an Intel 486DX2/50; and a 60MHz Pentium is faster than a 486DX2/66.

At current prices, the slowest CPU worth considering is a 486SX/33. The only difference between a 486SX and the more expensive 486DX is the latter's floating-point math unit, which won't do much for music-oriented software. (You might need a DX if you plan to use your PC to run AutoCAD or some other program that requires a math unit.) The number after the slash — e.g. /33 — refers to the speed, in megahertz, at which the processor runs.

If you can afford to spend a couple of hun-

dred bucks for more speed, a 486DX2/66 is currently a good buy. This "clock-doubled" chip (the numeral 2 after the DX indicates the doubled clock speed) fits in the same motherboards as a 486DX/33, but runs at twice the speed internally. There are also DX2/50s, but they're not much cheaper than 66s. By the time you read this, there will probably be clock-tripled 100MHz 486s on the market, which should be an excellent value. PCs based on Intel's newest chip, the Pentium, are very fast, but they're also cutting-edge technology and, as such, are quite expensive. It's likely that 486s will remain significantly more cost-effective than Pentiums for at least a year, and they're more than fast enough for today's music software. (The Pentium would logically have been called the 586, but you can't trademark a number, and Intel doesn't want to give the cloners any help.)

Whatever 486 you buy, get one that can be upgraded later to a faster CPU. There are two ways to do this. The most flexible is by a simple chip swap: Pull out the old 486 and replace it with a 486DX2. (A system with a zero insertion force — a.k.a. ZIF — socket for the CPU will make it easier to get the old chip out and the new one in.) The other upgrade path is Intel's: You just plug an "Overdrive" chip (a 486/DX2 with a slightly different pinout) into a special upgrade socket, and it puts the old CPU to sleep. You can see why Intel likes this approach: You end up buying two of its CPUs for one system.

Some 486s these days are billed as "Pentium ready," but that's not likely to prove a cost-effective upgrade path. To get the full benefit of a 64-bit Pentium, you need a motherboard with a 64-bit memory bus and expansion slots. In a motherboard designed



Intel's newest chip, the Pentium, is very fast — and, being cutting-edge technology, rather expensive. It's likely that 486s will remain significantly more cost-effective than Pentiums for several years, and they're more than fast enough for today's music software.

for the 32-bit 486, upgrading to a clock-tripled CPU should offer an equivalent power boost at a lower price.

## MEMORY

Thanks to a 1993 fire that wiped out a Japanese factory in which 60% of the epoxy used in memory chips was made, the price of RAM jumped from \$25 a megabyte to \$50 — and the market still hasn't returned to pre-fire levels. Consequently, you'd do best to buy no more RAM than you need, while keeping your upgrade options open.

Configuring your SIMMs right at the beginning will save you money when bloated RAM-devouring applications force you to upgrade. For running Windows, the practical minimum is 4Mb, but as any experienced user can tell you, Windows runs much better with more. Most MIDI software vendors strongly recommended going with 8 megs. If you insist on buying a 4Mb system, at least make sure that it has enough empty RAM sockets to add another 4Mb.

The PC industry is currently in the process of switching from the old 30-pin SIMMs

*What we want and what we can afford are often two different things. Listed here are bare requirements for a new PC-based MIDI music system, plus recommended upgrades for those who can do a bit of splurging.*

	MINIMUM	RECOMMENDED	BETTER
486 CPU type/speed	SX/33	DX2/66	DX3/99
RAM	4Mb	8Mb	16Mb
Bus slots	6-8 ISA	4-6 ISA & 2 VLB	4-6 ISA & 2 VLB
Hard drive	130Mb	250Mb	350Mb & up
Super-VGA board	ISA	local bus or accelerated	local bus and accelerated
Monitor tube size	14"	14"	17"
Monitor dot pitch	.28mm	.25mm	.25-.26mm
Monitor resolution	800 x 600	800 x 600	1,024 x 768
Modem	2,400 baud	14.4 Kbaud	14.4 Kbaud



# PC POWER SHOPPING

(a.k.a. x9s) to the newer 72-pin (a.k.a. x36s) SIMMs. The old type has a couple of serious disadvantages: You have to upgrade them four at a time, and they only come in 1, 4, and 16Mb formats. In a typical eight-socket system, you could upgrade from 4Mb to 8Mb by adding four more 1Mb SIMMs, but to upgrade further you'd have to go all the way to 20Mb, pulling out four 1Mb SIMMs and replacing them with four 4Mb modules. Some PCs won't let you mix SIMM types. In that case, you'd have to pull all eight modules before installing the 4-meggers, leaving you with a stack of unusable 1Mb SIMMs with dubious resale value.

With the new 72-pin SIMMs, life is much easier. You can add memory one module at a time, and they're available in 1, 2, 4, 8, 16, 32, and soon 64Mb versions — though not all PCs will accept all of these. In a typical four-socket system, you can upgrade from 4Mb to 8Mb by adding a single SIMM, then upgrade twice more to almost any configuration you'd like by adding or replacing additional SIMMs. Be sure to tell your vendor to install the initial memory in one big SIMM

— otherwise they might fill up the sockets with small ones.

## WHAT BUS SHOULD YOU TAKE?

PCs currently on the market use five different and (mostly) incompatible expansion bus standards. Here's a quick rundown:

- **ISA (Industry Standard Architecture):** The vast majority of PCs past and present have ISA slots. ISA is also referred to as the "AT bus," after the IBM PC-AT, the original 286, which set the basic design followed in today's 386 and 486 systems. Most of the expansion boards on the market are designed for ISA slots, so you definitely want some in your PC.

- **EISA (Enhanced Industry Standard Architecture):** A faster version of ISA. EISA slots can hold either EISA or ISA boards. EISA has caught on mostly for network servers, and consequently most EISA boards are things like Ethernet adapters and high-speed disk controllers.

- **VLB (VESA Local Bus):** The Video Electronics Standards Association developed this slot standard as a simple and inexpensive way

to install faster video boards in PCs. It caught on quickly, and a large percentage (perhaps the majority) of PCs sold today include one or two VLB slots.

- **PCI (Peripheral Component Interconnect):** Many manufacturers are planning to use this Intel-developed bus in next-generation computers — Apple in its PowerPC Quadras, Silicon Graphics in its R4000 workstations, DEC in its Alpha boxes. At the moment, though, only a few Pentium systems have PCI slots, and there are only a handful of boards to plug into them.

- **MCA (Micro Channel Architecture):** Found in some IBM PS/2s and pretty much nowhere else. Compared to ISA, MCA boards are expensive, and the selection is limited. Now that IBM is selling PCs with ISA, VLB, and PCI slots, MCA looks like a dead end.

For musicians, the best choice is a system with five or six ISA slots and a couple of VLB slots. Alternatively, you could get an ISA system with local-bus video built into the motherboard (more on that under "Video Boards and Monitors," below).

## HARD DRIVES

These days, you're unlikely to find a new PC with a hard drive smaller than 130Mb — more than adequate for sequencing and

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Add some color to your low end with the Peavey DPM® Spectrum™ Bass. The name says it all. This rack-mount bass module covers the whole spectrum of bass voices. From finger-picked and slap electric bass, fretless electric bass and pizzicato upright bass to tons of analog and digital synth basses, the Peavey Spectrum is chock full of all the hot new sounds along with the standard classics.

The Spectrum features 8-voice polyphony and 4-channel multi-timbral response, allowing four presets to be layered or accessed on individual MIDI channels.

Front panel controls include basic preset selection, transposition, pitch bend range, fine tuning, and MIDI reception mode (complete preset selection available via MIDI).

Other features include stereo audio outputs, MIDI in/out/thru connectors and MIDI overflow for daisy-chaining modules.

The Peavey DPM Spectrum bass covers all the basses. And as usual, the price is right. See your local Peavey dealer for a demonstration.

- ▼ 8-voice polyphonic
- ▼ 4-voice multi-timbral
- ▼ 1 Mb of 16-bit samples
- ▼ 200 presets
- ▼ Layered presets for even fatter sounds
- ▼ Interface to keyboards or Peavey Cyberbase™
- ▼ Mono/Legato mode
- ▼ Fine tune and transpose



# PEAVEY®



# PC POWER SHOPPING

transcription work. If you want to get into digital audio, however, you'll need a lot more storage. Larger drives now cost less than \$1 per megabyte. Those in the 350Mb and 1.2 gigabyte range are particularly good values. If you're planning to buy a Digidesign Session 8 hard disk recording system, note that you may need only a small hard drive in your PC — the big drive, which holds the audio files, attaches via SCSI to the Session 8 card.

Currently, there are two drive interfaces commonly found in PCs. IDE drives are the most common, since IDE adapters are less expensive and easier to configure. The only problem is that IDE drives max out at around 500Mb, and you can't install more than two in the same system.

For more storage, you need to use SCSI, which is also required by many CD-ROM, optical, and tape backup drives. SCSI adapters (Adaptec and Future Domain are the most popular) cost about \$100 more than IDE, and SCSI drives sometimes cost a bit more than their IDE counterparts as well. (The SCSI interfaces found in some sound boards are designed for slow CD-ROM drives and won't

give the best performance from your hard drive.) You can hang up to seven drives off a single SCSI adapter, and if that's not enough you can install multiple adapters in your PC. The down side is that using SCSI requires installation of two or three drivers in your CONFIG.SYS and AUTOEXEC.BAT files, and getting those configured properly can be tricky.

## OTHER TYPES OF DRIVES

The 3.5", 1.44Mb diskette is pretty much standard these days. There are also 2.88Mb drives available, but the special disks they use are so much more expensive that they haven't caught on. If you need to exchange floppy disks with people using older computers, you'll want to get a 5.25" 1.2Mb drive as well. Have the vendor configure it as the B: drive, and the 3.5" as the A: drive.

Backing up 100Mb of data to floppy disks takes an absurd amount of time, so a tape backup unit roughly the size of your hard drive is a good investment. For smaller drives, you can get a 250Mb tape backup that attaches to your floppy disk cable for under

\$200. For gigabyte-range drives, data DAT drives start under \$1,500.

If you're buying a CD-ROM drive, look for multisession PhotoCD support. Even if you don't plan to use PhotoCDs, choosing a compatible drive ensures that you're getting a fairly up-to-date model. I strongly recommend getting a double-speed drive. This spins the disc twice as fast to pump data at twice the rate of older models, but can still step down to regular speed when playing audio CD tracks. If you don't mind spending extra for better performance, triple- and quad-speed drives are now available. CD-ROM drives commonly come with a stack of CD-ROMs, but all too often the bundled titles suck.

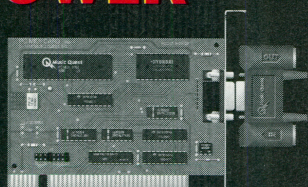
## VIDEO CARDS AND MONITORS

Slow screen redraws can make even the fastest 486 feel sluggish, so it's *worth spending* a little extra on faster video. There are two basic approaches to speeding up PC graphics.

- Local-bus video lets the computer send data to the screen faster than it could to a conventional ISA-bus video board. Local-bus video can be built into the motherboard (big-name companies like Compaq and Dell favor this approach), or you can get a system

*Continued on page 58*

## PLUG-IN IBM MIDI POWER



### The PC MIDI Card™

The PC MIDI Card lets you focus on your music instead of your interface. It's fully MPU-401 compatible and comes with a multi-client Windows driver to run *your* music software, in *your* PC, including the latest 486's. Just plug it in and forget it. See why the original low cost MIDI card still sets the standard, both in price and performance.

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# The Top 500



Play the D4 with its onboard trigger inputs.

Alesis drum machines are famous for their sounds. The HR-16's natural acoustic drums are still the standard for transparent rhythm tracks. The punchy aggressive samples of the HR16:B redefine how to make rhythm tracks burn. The SR-16 is an instant hit with its sampled reverb and ambience techniques.

Now you can have all this and more with the new **Alesis D4 Drum Sound Module**. There's an incredible 500 sounds in all. Right at your fingertips.

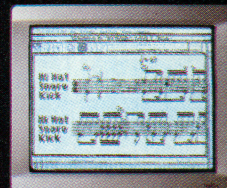
The D4's sounds are unparalleled for their realism. For example, when you hit a D4 sound harder, the tone *and* pitch change just like a real drum, thanks to the D4's Enhanced Dynamic Articulation.™ Plus, stereo reverb and ambience are built into many of

the samples so you can keep your mind on the beat.

Using the D4 is a breeze with its large data entry knob and dedicated buttons for all major functions. There's even a touch-sensitive preview button and headphone output for instant gratification... and latenight drumset programming.

The D4's 21 user definable drumsets are accessible via MIDI or through the 12 onboard audio trigger inputs. You can even replace a wimpy drum sound on tape. Which you'll want to do if it didn't come from a D4. No rocket science here. Just pure honest incredible sound. The only reason to buy a drum sound module.

Everybody wants a hit. The D4 has 500 of them right now. At your Alesis dealer.



Play the D4 with MIDI software or hardware.



12 audio trigger-to-MIDI inputs are built in for drum triggers, pads, or tape.



## ALESIS THE TOP 500 DRUM SOUNDS

THIS WEEK	LAST WEEK	WKS. ON CHART	TITLE ARTIST	DRUM PRODUCTION	THIS WEEK	LAST WEEK	WKS. ON CHART	TITLE ARTIST	DRUM PRODUCTION
1	2	208	HONEST SNARE HR-16	ALL WOOD-BRASS RIM	302	NEW ▶		RAW HIDE BRAND NEW D4	CUSTOM S
2	NEW ▶		STUDIO TOM BRAND NEW D4	16" MAPLE TOM w/VERB	303	450	52	HI ROOM TOM SR-16	10" MAPLE
3	NEW ▶		BIG "O" BRAND NEW D4	DOUBLE HEAD KICK w/VERB	304	NEW ▶		WET HALF BRAND NEW D4	HALF OPEN H
4	5	52	RIM SHOT ROOM SR-16	BRASS PICCOLO w/VERB	305	327	52	RIM 2 CENTER SR-16	ARTIC
5	10	156	BIG FOOT HR-16:B	SINGLE HEAD 26" MAPLE	306	123	208	DOUBLE HEAD	DOUBLE HEAD K
6	NEW ▶		SLAM BRAND NEW D4	POWER TOM w/VERB	307	223	156		
7	23	156	COMBO SNARE HR-16:B	PICCOLO PLUS WOOD	308	401	5		
8	NEW ▶		BIG BALLAD BRAND NEW D4	WOOD SNARE w/BIG VERB	309	NEW ▶			
			FAT CITY	SUPER FAT SNARE	310	175	1		
					311	NEW			



Alesis Corporation 3630 Holdrege Avenue  
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All of this in one easy-to-use, integrated instrument!

*Here's how easy it is to produce professional quality demos:*

- Sequence up to eight tracks of sampled instruments.
- Record lead and background vocal tracks through onboard EQ and delay.
- Bounce down the vocals (through a plate reverb) to make room for a sizzling guitar solo.
- Mix your composition through a final EQ/reverb blend.
- Play out through the optional digital I/O to a DAT recorder *and you're finished!*



*There's a studio inside this rackmount ASR-10, with SCSI standard.*



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# PC POWER SHOPPING

Continued from page 54

with VLB slots and plug in a VLB video board.

- Accelerated video offloads some of the video processing from the CPU to a special chip on the video board. This greatly reduces the amount of data the CPU needs to send to the board, so you can get much better performance despite the ISA bus bottleneck.

The major difference between the two is that local bus speeds up loading of

scanned and "paint" graphics and playback of digital video, while accelerators speed up "draw" or CAD graphics and movement of objects around the screen. The two approaches are often combined, giving you the benefits of both.

When running MIDI software it's nice to be able to keep a lot of windows open on screen at once — sequencer tracks, event edit

lists, virtual mixers, etc. A standard VGA monitor's 640 x 480-pixel resolution doesn't really offer adequate screen real estate for the task. A better choice is 800 x 600 super-VGA, which demands a sharp (.28mm or smaller dot pitch) 14" or 15" monitor. Good ones start around \$350, and top-quality Trinitron-based units cost around \$600. Better still is 1,024 x 768 super-VGA. Most people find that such high resolution makes text, menus, and icons too hard to see on a small monitor, so you usually see 1,024 x 768 on 17" and larger monitors, which cost \$1,000 and up.

## MODEM

What does a modem have to do with music? Let's say you install an upgrade to your sequencer, and when you try to use it the program pops up an error message that says you need to upgrade your MIDI interface's driver. Without a modem, you'd have to phone the vendor and get them to mail you the new driver. With a modem, you'd just log onto CompuServe or dial the vendor's BBS, download the file, and get to work.

The best buys right now are internal 14.4Kb (a.k.a. v.32bis) modems with built-in data compression (a.k.a. v.42bis). A good one shouldn't set you back more than \$150. You can get a 2400 baud modem for under \$50, but you may end up paying more in the long term in bigger bills from the phone company and CompuServe.

## MULTIMEDIA PCs: A GOOD DEAL?

The "multimedia" PCs you see advertised are really designed more for playing computer games than for use with MIDI. They could still be a good deal — provided they include the hardware you really want — but that's not too likely. The main problem is that the \$100-\$200 sound boards used in these systems aren't really intended for the kinds of things musicians want to do.

Their minimal MIDI interfaces aren't adequate for serious recording, or for keeping a stack of instruments in tight sync. You're not likely to be impressed by the synth module, usually a funky two-operator FM unit that's just one step up from a Nintendo game. The digital audio can sound pretty good (depending on the card), but there's not a whole lot you can do with it beyond making sound effects. Consequently, most musicians will be better off buying a standard PC and installing the MIDI, synth, and digital audio boards they really want.

Unfortunately, getting all that stuff to work together can be a real pain. We'll take a look at common configuration problems and offer some troubleshooting tips in an upcoming issue. ■

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# Can You Find the Best Value in Effects Processors?

Look closely at the image above to find the answer. Or keep reading and look again when you're done.

We've used this image to make a point:  
the DP/4 Parallel Effects Processor  
stands out from the crowd in  
flexibility, quality, and value.



## To find the hidden 3D image:

Diverge your eyes as if looking at a distant object. The two dots will fuse, forming a third central dot. Allow your eyes to "space out" and gaze through the image. Now relax and hold your gaze steady while observing the rest of the image in your peripheral vision. When you hold the patterns overlapped and fused long enough your brain will decode the computer-created image in the patterns.

## Or:

Hold the image so close to your eyes that it touches your nose. Relax your eyes and allow them to space out looking through the image. Slowly move the page away from your face, holding it level. When the image is several inches away you'll sense depth in the picture. Relax, staying spaced out as you gaze through the image. The 3D image will develop like an instant photo.

effects from column A and some from column B. It's why reviewers say "sounds amazing"<sup>1</sup>, "so perfect that no further processing was necessary"<sup>2</sup>, and "I love this box, I love this box, I love this box."<sup>3</sup>

## Much more for less

Along with four effects processors (*with four inputs/outputs*), the DP/4 has a built-in digital patch bay and submixer — for a fraction of the cost of separate gear. You can instantly change setups — for example, from enhancing a single instrument with all four effects to processing up to four separate signals at once. And use advanced MIDI control to automate changes from your sequencer or MIDI keyboard. It's an obvious value when you look at how many "budget" effects processors you'd have to buy to get the same result.

So take a second look to find the best value in effects processors — the ENSONIQ DP/4. For an even closer look, see your local Authorized ENSONIQ Dealer. Call 1-800-553-5151 for the one nearest you.

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Only the DP/4 has four independent 24-bit processors, with the flexibility to combine them to fit any situation. If you need four different reverbs for a mixing session, you've got them. Need a fast digital compressor for a bass track? Just dial it in. From reverbs, chorus, delays, pitch shifting and EQ to multi-effect chains for guitar or vocal processing — the DP/4 has it covered.

## No-compromise sound

No matter what effect or combinations you use you'll always get the highest fidelity sound. Never again compromise sound quality by choosing some

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<sup>1</sup> EM, December 1992

<sup>2</sup> Sound on Sound, October 1992

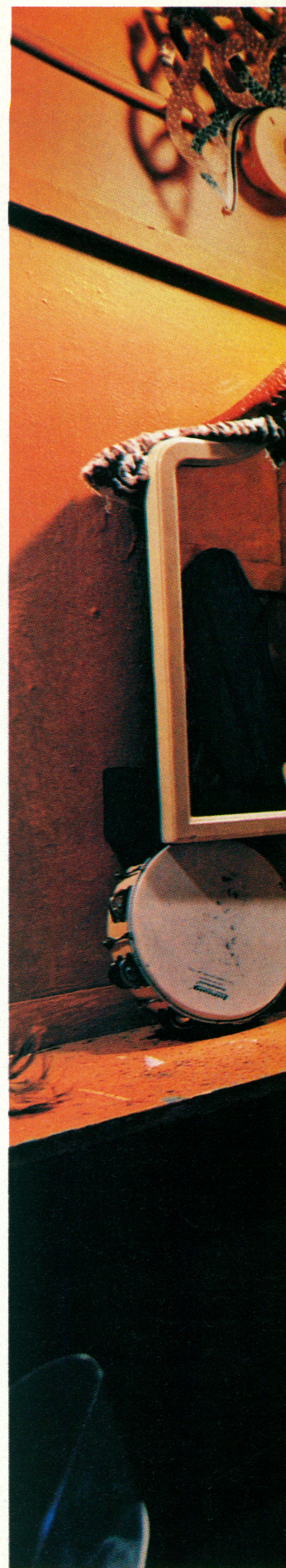
<sup>3</sup> EM, September 1992



# <sup>A</sup> Under Hoodoo MOON

*Reflections on an Extraordinary Life in  
Music from the Upcoming Autobiog-  
raphy by Mac "Dr. John" Rebennack*

The drawl pours like molasses, practically clogging the line. Though Mac Rebennack lives in New York now, his speech, like his music, is pure New Orleans, aged and seasoned by years on a circuit that began in strip joints and led uptown to the bright lights of fame. We're talking with Rebennack, a.k.a. Dr. John, disciple of Professor Longhair and arguably the greatest







*Photograph by Jim Marshall*



# Dr. John

living practitioner of New Orleans piano, about his autobiography, *Under a Hoodoo Moon*, scheduled for publication in March by St. Martin's Press. Peppered with colorful characters and affectionate recollections of times long past, the book speaks in Rebennack's voice, dispassionate yet expressive. Rules of grammar get short shrift, but there's more humor and pathos in his idiomatic ruminations than most folks can wring from textbook English.

"You know," he tells us, "at one time, me and [pianist] Allen Toussaint and [drummer] Earl Palmer and some guys was talking about



**A young Mac Rebennack onstage, before a gunshot wound to one hand brought his six-string career to an end.**

getting [producer] Cosimo Matassa and just talkin' into the tape recorder about the way things was, not the way people that wrote books about New Orleans wrote it. Just tell how things really was. That's what I was tryin' to do with this book. I was hoping to give some kind of inside thing of the way stuff was, so maybe some other guys that was around there might decide to do something else later."

Through interviews with co-author Jack Rummel and encounters with some of his old colleagues from New Orleans, Reben-

nack has pieced together a compelling story. He describes struggles with drugs that date back to his teenage years, and recounts his experiences in prison. For all the grit and grind of his early years, he casts his youth in shades of fond remembrance; his deadpan reflections make stardom seem infinitely more absurd than obscurity.

"Everything's opinions," he shrugs. "I look at shit how I look at it. Now, working the kind of gigs I did does keep your chops up. We used to do four hours in one joint, then go two doors down, work four hours, then walk a block down and work a jam session for four more hours. There's no scene like that now. There's some guys at cuttin' contests who would steal somebody's gig or whatever. But just havin' fun is part of something that was, and that's just so gone. But that's a trap too. If you love music, it's great to play all night, especially when your last gig is like a jam session. It's almost like that's what you should do after the gig. But you ain't gonna make much money doin' it."

For all he's done, writing a book was one bridge Rebennack never thought he'd cross. "It was a weird experience for me to dredge up a lot of old crap," he admits. "Apparently I had forgot a lot of stuff, and I probably remembered a lot of stuff I wouldn't have never thought of. Some things came out of talking to different people about stuff we hadn't none of us talked about before. Some of it was cool."

Rebennack's next album, his debut on GRP, untitled at press time, will be released in tandem with the book. It promises to be classic Mac, a collection of original tunes and standards given full *fonk* treatment by a lineup that includes his longtime guitar colleague Hugh McCracken. Its aim is clear: To spread a little more of that New Orleans vibe across the airwaves. The book, on the other hand, takes the message a bit deeper.

"What I want to say in this book," he concludes, "is that you don't have to do stuff as stupid as I did or other people did. Just play music and try to learn from it as much as you can."

The lesson starts here, with these excerpts from *Under a Hoodoo Moon*.

—Robert L. Doerschuk



**By Dr. John (Mac Rebennack)  
With Jack Rummel**

**Junko Partner:  
Early Days in New Orleans**

By the time I made it to the third or fourth grade, I had developed a taste for hopping

the train and riding out toward Gentilly Road instead of going to school. I had a friend out there, and we'd go round up a few other kids to hang out with. One of us would go into a hardware store and steal a sinker, another would rustle up some bait, and we'd go fishing. That was fun while it lasted, but I wasn't long into innocent kid stuff before I found better things to do.

Among the discoveries I made were the rhythm-and-blues clubs down on Canal Street — and the cutting contests that went with them.

There were so many killer piano players floating around in those days that an unwritten law of the jungle had come down. It was simple, and it went like this: You had better be able to cut somebody — beat them at their own piano game — or you wouldn't get a club date. To get and keep regular club gigs, you had to be a bad motherfucker. In a cutting contest you'd have a band playing, with four or five piano players sitting at the table next to the bandstand. The regular player would work his stuff, and after a while the band leader or club owner would call up the guys known as the "cutters." The first cat would come up, slide onto the bench, and keep it going. And he had better cut the original guy, or he sure wouldn't last long. If he did real bad, the band would just end the song on a key change. It could be that cold.

The guy who blew everybody else away ended up being the one who kept the gig with the band at the club. The guys whose job it had been usually ended up with a two-week notice, if he was lucky, and a case of the chronic sweats. That kind of shit happened all the time — and it wasn't just the piano players who had something to fear. When they had cutting contests, the focus could change suddenly to any guy on the bandstand.

The contests started all kinds of ways. It might be just one guy wanting to steal another guy's job. The actual cutting most often happened after hours, when musicians got off other gigs. Two or three players might get around and start conspiring against the guy holding the slot the others coveted. I saw this kind of action all over town while I was growing up. I mean, you'd see cats get annihilated so bad the poor suckers would never find a good gig again. People could make you look so lame you'd be plexed forever after.

Usually the flashiest guy — but not necessarily the hippest player — would come out ahead in a cutting contest. It could be a real sad scene: You'd see some piano player with all kinds of flashy hand stuff draw musical blood. The guy'd look great, even if he didn't always sound that good. But that's show biz.





**The Dew Drop Inn in New Orleans, "one of your prime pit stops on what was then called the chitlin circuit." Here, Rebennack heard Ray Charles, Bobby Bland, James Brown, and Sam Cooke, not to mention Black Beauty and Her Powder Puff Revue.**

I didn't know anything about all this back in the days when I was hanging around outside the clubs with my father. Later, I realized I must have been hearing cutting contests all the way back then. I remember one at the Norwegian Seaman's Hall that stayed with me: When I got there, I saw one tenor player up there really cooking. I was hanging near the doorway of the club, and my father didn't glimmer me for a while, so I got to see a second guy glow and get serious house. He'd cut the first one. My father saw me while the joint was still raisin' sand up, and scooted me out of there fast.

Later I saw a lot of these showdowns. Some clubs had a real attitude about them. Paul Gayten had regular cutting contests at his club, the Brass Rail on Canal Street. Canal Street was a happening area at the time; in a couple of blocks you could find three or four jumping juke joints — the Monkey Bar, the Texas Lounge, and the Brass Rail being the hottest.

I got to know Paul when I was in fifth or

sixth grade. I'd skip going to Mass at Sacred Heart, jump on a streetcar, and slide down to the Brass Rail first thing in the morning to hear their last set. About eight in the morning was prime cutting and after-hours time. The clubs had been open all night and everyone was burning hot before they crashed for the rest of the day. . . .

I liked to hang out with the musicians as much as I could. At the Texas Lounge, I'd go all the way to the back of the club to the dark little booth where the white club owner made the black band members sit. The idea was that they were supposed to disappear after showtime. It was a jive situation, but the cats took their little area and got their partners to sneak in and they ended up doing what they wanted without too much hassle. I just sat there, quiet as a mouse, and listened to them cutting up on their break.

I loved hanging around them guys, and I learned a lot from them. They played every old standard in the world; they had moves for songs that transformed them into another

dimension, and I thought: Oh, my God, they actually make this shit-music that I hate sound good.

Paul Gayten did the same thing, but in a whole 'nother way. He never played a song the same way twice. One time it might be a ballad, the next time he'd turn it into a cha-cha, the next a meringue, the next a mambo. It would change. There was no standard arrangement. They took any request the audience threw at them, but if they didn't like it, they'd mock it. That's what got me hooked on Gayten's band. They didn't look at no music like it was sacred. They just fucked with it, and that was so hip to me. . . .

A lot of musicians in New Orleans back then took whatever job they could just to keep them in food and drugs, and a lot of the gigs

#### **Mac Rebennack: A Selected Discography**

##### **As Leader/Co-Leader**

- Bluesiana II*, Windham Hill.
- Bluesiana Triangle*, Windham Hill.
- Brightest Smile in Town*, Clean Cuts (Box 16264, Roland Park Stn., Baltimore, MD 21210).
- Dr. John Plays Mac Rebennack*, Clean Cuts.
- Goin' Back to New Orleans*, Warner Bros.
- Gris-Gris*, Alligator (Box 60234, Chicago, IL 60660).
- In a Sentimental Mood*, Warner Bros.
- On a Mardi Gras Day* (w/ Chris Barber), Great Southern (Box 13977, New Orleans, LA 70185).
- Take Me Back to New Orleans* (w/ Chris Barber), Black Lion (dist. by DA Music, Box 3, Little Silver, NJ 07739).
- Triumvirate* (w/ John Paul Hammond & Mike Bloomfield), Columbia.
- Ultimate Dr. John*, Warner Special Products (dist. by Warner Bros.).

##### **As Sideman**

- Against the Wind* (w/ Bob Seger), Capitol.
- Another Passenger* (w/ Carly Simon), Elektra.
- Coming Out* (w/ Manhattan Transfer), Atlantic.
- Crawfish Fiesta* (w/ Professor Longhair), Alligator.
- Exile on Main Street* (w/ Rolling Stones), Rolling Stones.
- Goodnight Vienna* (w/ Ringo Starr), Capitol.
- Last Waltz* (w/ the Band), Capitol.
- Buddy Guy & Junior Wells Play the Blues*, Rhino.
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# Dr. John

you ended up with were peculiar, to say the least. I got turned on to some of the more extreme clubs when I was a little older — around my 16th birthday. One night Huey Smith, the piano player for a popular band in town called the Clowns, took me down to a place called the Dew Drop Inn. The Dew Drop was primarily a black club, but it attracted a small white audience too. Because of the segregation laws, whites and blacks were supposed to be separated inside the club, though in reality whites would usually just congregate in one corner. The Dew Drop was one of your prime pit stops on what was then called the chitlin circuit, which was the string of clubs in the South that featured the main R&B (and early rock 'n' roll) acts of the day. Virtually every current star, faded star, and future star in the business passed through the Dew Drop, from Joe Turner, T-Bone Walker, Charles Brown, and Big Maybelle to Ray Charles, Bobby Bland, Sam Cooke, and James Brown — just to name a few.

These were the headliners, who usually played on weekends. On the off-nights, a different kind of action was featured. During these evenings, the Dew Drop was taken over by extravagant drag-queen revues, backed by a big, seven-piece house band with a horn section. The show was choreographed down to the last high kick, and the costumes were ultra-sharp. Now, I went there to cop on the music. But, man, when I hit the door, I knew I had encountered something else again.

We sat down and I guess I was trying to act like this was all just another night in Babylon, but I wasn't faking it very well. That night, the Dew Drop was turned out totally drag. Black Beauty and her Powder Puff Revue started things off by hitting the stage singing "I'm a woman trapped in a man's body. I live the life I love and I love the life I live. . . ." Then another queen came out, with the star singing the "St. Louis Blues," with its tag-line "I hate to see the evening sun go down" — only he would change it a little so it came out, "I hate to see my youngest son go down." The headliner was an act called Sir Lady Java, who came out, flashed tits, then at the end of the show flashed a dick too. I had a hard time handling it. Huey and the other guys laughed their asses off at me because I was so innocent. But this was just Huey's way of

hipping me to show biz in New Orleans.

*[Eventually Mac's innocence became a matter of history, and the young pianist hit his stride in the teeming New Orleans club scene. His schedule got even busier when he started playing Hammond organ. James Booker, already a legend around town, gave him his first lessons on the instrument and helped him land jobs at strip clubs — Madam Francine's, Trader John's, and Papa Joe's — where backing exotic dancers was only the beginning of an evening to remember.]*

After our nine-to-midnight gig (for the *turistas*), things began to get a bit more interesting. From midnight to four, you had a different crowd, hip but not street characters. After four in the morning, you got the real low-down crowd, when the hustlers, pimps, whores, con artists, high-rollers, and all the other characters put in their appearance. By about four, these folks had finished up with their hustle and wanted to spend their money or make up what they'd lost by jackin' or jef-fin' somebody.

The jam sessions after hours at Papa Joe's were great. People showed up from all over town. Besides the hustlers and characters, a slew of out-of-town bands — whatever act happened to be working at Al Hirt's club, Lionel Hampton's band, Cab Calloway's band, Boots Randolph, Don Jacoby — would drop by. The music got way down during this stretch. We played your real serious New Orleans junko blues, and the racial barrier on performing (and anything else) tumbled because of the absence of *turistas*. These sessions were for the diggers and those who dug the lifestyles of the hip and crazy. The police knew that, and by and large they left us alone.



**Rebennack on one of his innumerable session dates, 1979: "It's still painful to think about some of the lames that I ended up working with to survive."**

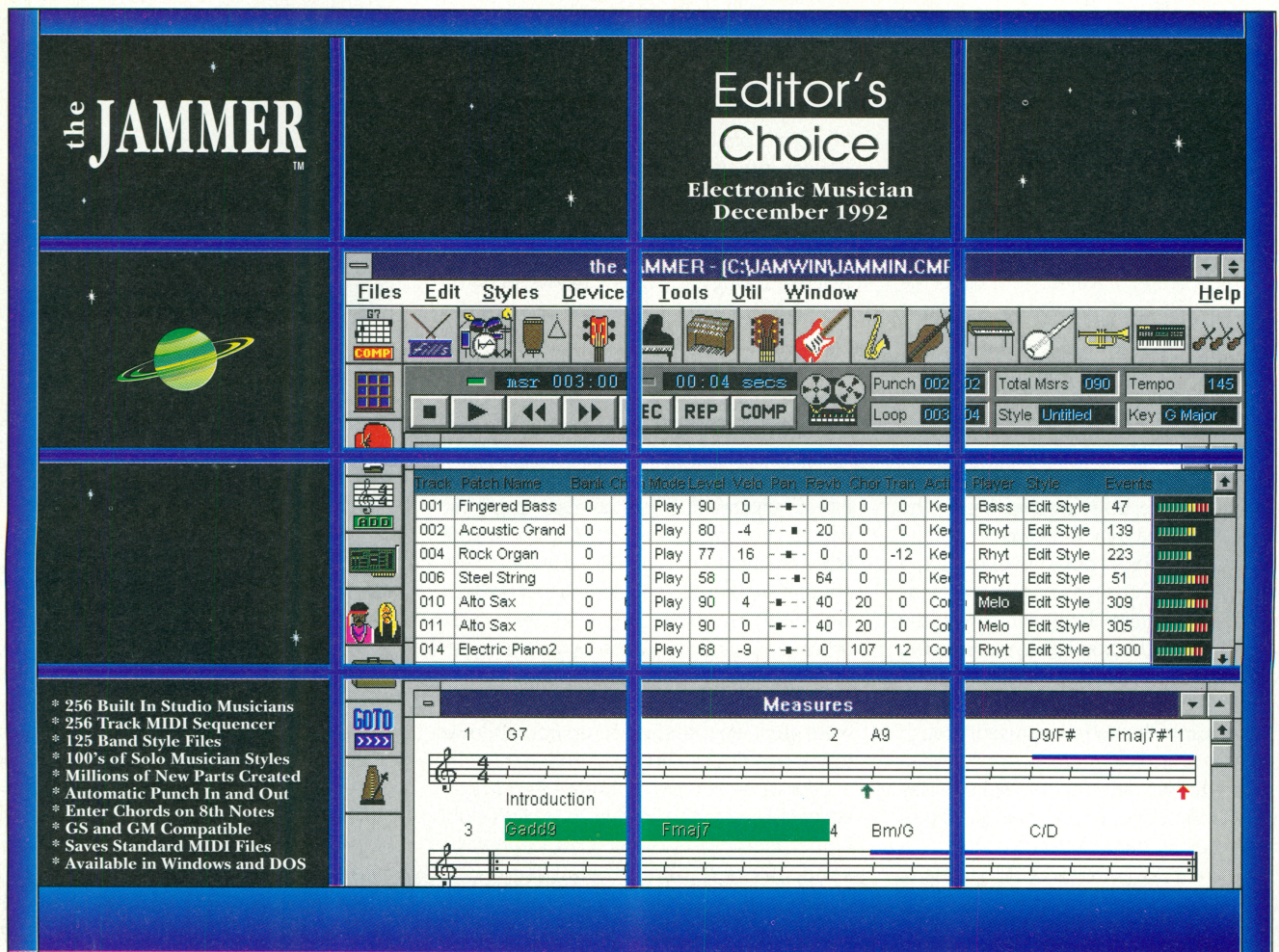
Those sessions were the first times I had to sing and work a house. When the regular singer got too hoarse to do it, I'd take over and handle the lyrics. By popular demand, I'd get up and sing long-ago-and-far-away standards like "How Much Pussy Do You Eat" or "Dope Fiend Blues." Along with the regulation standards like "Junko Partner" and "Lush Life," this was the stuff this crowd liked to hear. No watered-down material for them: It was lyrics like "I'll sit right down, roll myself a reefer" that went over. "Turning tricks, sucking dicks, making bread, giving head. . . ." — they spoke to their audience. That crowd also loved it when we'd mess with the popular songs of



**Seated at a Yamaha CP-80, Rebennack lays down licks perfected long before in cutting contests that only the strong survived: "You'd see cats get annihilated so bad the poor suckers would never find a good gig again."**





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# Dr. John

the time. You'd take something like "Got My Mojo Working" and rewire it so it came out "Got my little kilo Bella hustling and my junky partner won't 'turn on' you. . . ." — things like that. These lines had nothing to do with the song but applied to the crowd. . . .

You'd see some screaming action during those wee hours. I had a friend back then named Chang-Chang; he played organ in one of those joints, and ran a slick scam. He had a little monkey on a chain that sat on his back while he was playing. Late at night, Chang-Chang would do his little bit. If some poor customer was passing out and the joint was half empty, he'd send the little monkey out to roll him. The monkey would dance out and lift the guy's billfold, then bring it back to Chang-Chang, who would take what he needed out of it, give it back to the monkey, and send the monkey back to the drunk

to put the billfold in his coat pocket or leave it on the drunk's table. Even the animals were getting into the act.

## Hollywood Be Thy Name: Mac Does L.A.

In 1965, after I got sprung from my time [*i.e.*, released from prison], I packed my threads and headed in a straight line for Los Angeles. The scene in New Orleans was dead, and a few of my old partners from New Orleans were already out on the coast, doing all right.

My in was with Harold Battiste, which was both fortunate and unfortunate. Harold had slotted into a groove out there in L.A. where he had a lot of work, and the bright side was that he could give me quite a bit of it. On the dark side, it's still painful to think about some of the lames that I ended up working with to survive. [For example,] I was hooked into Harold Battiste's long-running ho-hum groove with Sonny Bono and Phil Spector. Harold was Sonny's producer, even if he didn't get the credit, and he worked a lot with Phil as a sideman and arranger. Harold quickly touted me to Sonny and Phil as a keyboard and guitar player.

Sonny Bono was trying desperately to

copy Phil Spector's hit sound at this time. I'd show up for the sessions and find all these guitar players — Barney Kessel, Howard Roberts, Donald Peaks, and David Cohn — on the session, plus killer keyboard players like Mike Rabin, Don Randi, and Mike Melvoin, all these tough musicians, and all we'd be doing — all of us — was ka-ding, ka-ding, ka-dang, broken arpeggios for nobody knows. It was a monument to waste and bad taste.

What Harold did, as far as I could see, was to take Sonny's songs and make them musically well-constructed. He did some great arrangements for them, considering what he had to work with: Sonny knew only two chords on the piano, so every song he wrote used the same two chords over and over. And Harold took these songs and heroically made them sound like real music (mostly by throwing more chords in and mixing it up into a progression that made some musical sense).

One of the songs that Harold really did up right was Sonny and Cher's "Bang, Bang." I was at Sonny's garage one night, and he was hammering out his usual two chords; you could hear the essence of a song in there somewhere, but it took Harold to make it happen. He did this all the time with their

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# Dr. John

records. When Harold first took me out on the road with Sonny and Cher, I was straw-bossing the rhythm section while he acted as straw boss for horns and strings. It was such a musical nightmare, my only concern was just to get the fuck away. . . .

After a bit, I threw in the towel with Sonny

and Cher and copped a job playing piano for Frank Zappa. Zappa had just put together his Mothers of Invention band, and I was supposed to be the piano player. I'd always go there to rehearsals with Elliot Ingber, who was a guitar player and a weed gourmet; I'd show up with a joint in my mouth, signifying I wasn't no dope fiend, just a weed head. Elliot would be signaling me behind Frank's back to get rid of the joint. I didn't know what the hell he was talking about, because I was looking at Frank Zappa, thinking this character must have been spaced on God-knows-what. What I didn't know then was that Frank was stone straight — he took no drugs of any kind. I did a couple of sessions for him, though.

Everybody in the studio but Frank was wandering around high on acid. Frank had written me this part to play, five or six notes on the piano over and over — not much better than Sonny and Cher. In the background, a twenty-voice choir croaked out monster sound effects, something like "Gggrrrrrh-hhrrr!" When I had had about all I could take, Les McCann walked in and I asked him to hold down my chair, telling him I had to go to the bathroom for a second. I walked out of there and never came back.

## Blue Mondays:

### Recollections of James Booker

James Booker was another of the special musicians who drifted in and out of our band in the '70s. I had lost track of Booker for a number of years during the '60s; then, when I was first traveling with the Dr. John show, I needed another keyboard player, and Hungry Williams turned me back in Booker's direction because Booker was in New York. In no time, I got Booker into the band, where he remained, on and off, until the late '70s. It was often his role to open the show for us, doing a medley of Little Richard or Ray Charles tunes. He'd set the house on fire, because he was always better than the opening act. . . . When he had his solos, he sparked and spanked. People would come backstage and say, "Man, that was great. Who was the organist? The piano player? Who was that guy?"

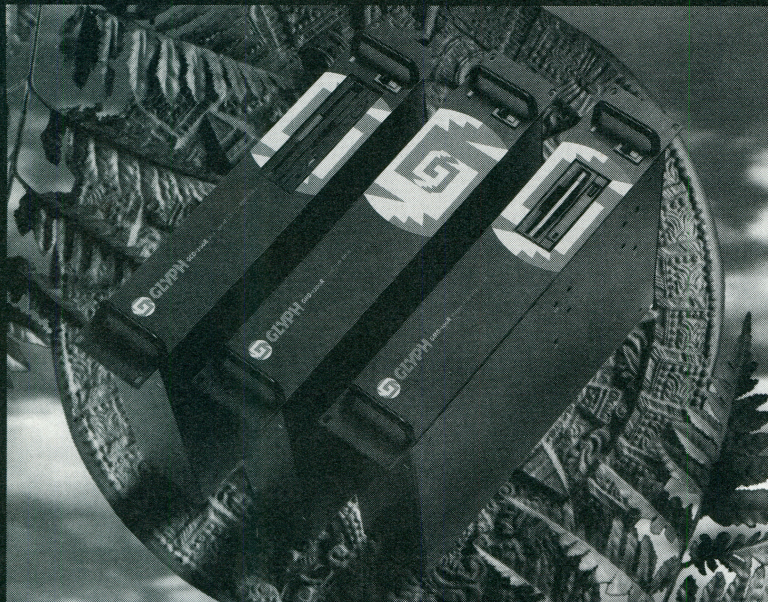
I'd say, "That's James Booker."

They'd say, "Never heard anything like that before."

For a while, Booker was giving me more nervous breakdowns than I could handle. At some point when he was still very young, Booker had gone out on the road with Shirley and Lee, and a cat named Larry had turned him out; I don't know if the episode had traumatized him or what, but there'd been a definite change in him in the years since — among other things, he was trying to fuck everybody in the band. He started in on this one young bass player and really messed up his head; the kid quit playing music. Booker said, "Don't worry 'bout him. The next one'll be even better." He really thought he was doing me a solid, thought he'd be making better singers and players of them. And he wasn't going to strong-arm anybody; he would do it by connivance. . . .

Booker could talk you to death about any subject. He was very spiritual; he'd studied deeply in many faiths. He always took time out to teach me things; it was Booker who taught me how to play piano like the great Harry Van Walls. On top of all that, all the while he was with our band he also was

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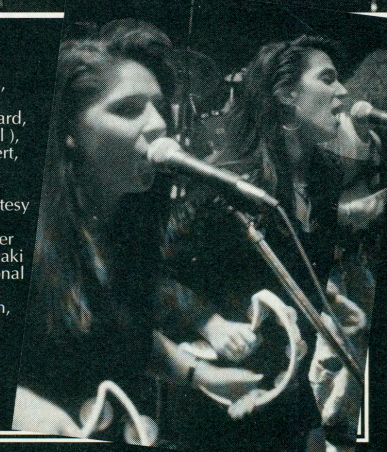
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# Dr. John

writing for a newspaper down in Mississippi and had an ongoing relationship with some monastery there. He used to go down there, take the songs we were doing on our gigs, plug in a whole new set of lyrics (substituting *Jesus* for *Baby*), and rock out with the monks.

Booker did the driving when we went on the road, and before long he was driving us crazy. We might be leaving New York for Richmond, Virginia. I'd go to sleep and then wake up half an hour later to find we're coming back through the Holland Tunnel. I'd say, "Booker, what the hell's going on?" He'd say, "Oh, I just gotta make a little stop, then we'll cut out." Well, he would stop off someplace in Harlem to cop, and then we'd bust ass down to Virginia. Booker could walk into any drugstore anywhere and be able to walk out of there with two bottles of narcotics, even if he had to sign for it. No one else in the band could get away with this. I don't know what Booker said, but it must have been mighty persuasive.

In the early '70s, about the time the Dr. John band started doing a lot of TV shows, Booker and I ran into this guy who wanted to cut a set of Beatles songs. Booker and I had written a bunch of arrangements for the record, which was going to feature Eric Clapton and a host of others. Booker went to collect our fees for the session; he got the checks copped and liquidated, then went right back to the people and somehow got the money again. We got paid twice. Then Booker called the people and put some story on them to the effect that we hadn't been able to cash the checks. They paid us a third time. Well, Booker figured if they went for this story three times, they would go for four, but the fourth time a big guy who was one of the Beatles' bodyguards — I still don't know exactly what he had to do with the session — laced Booker up so bad he lost an eye.

After that, Booker got even stranger. He became convinced that if he lost his other eye, he'd be able to play as well as Ray Charles or Art Tatum. About this time, I got on his ass because he was slugging off on our gigs so bad. [One] night at a gig, just as the MC was announcing me, Booker jumped out before me dressed up like Cleopatra and slipped in with the background singers. In those days, he had it in mind that he wanted

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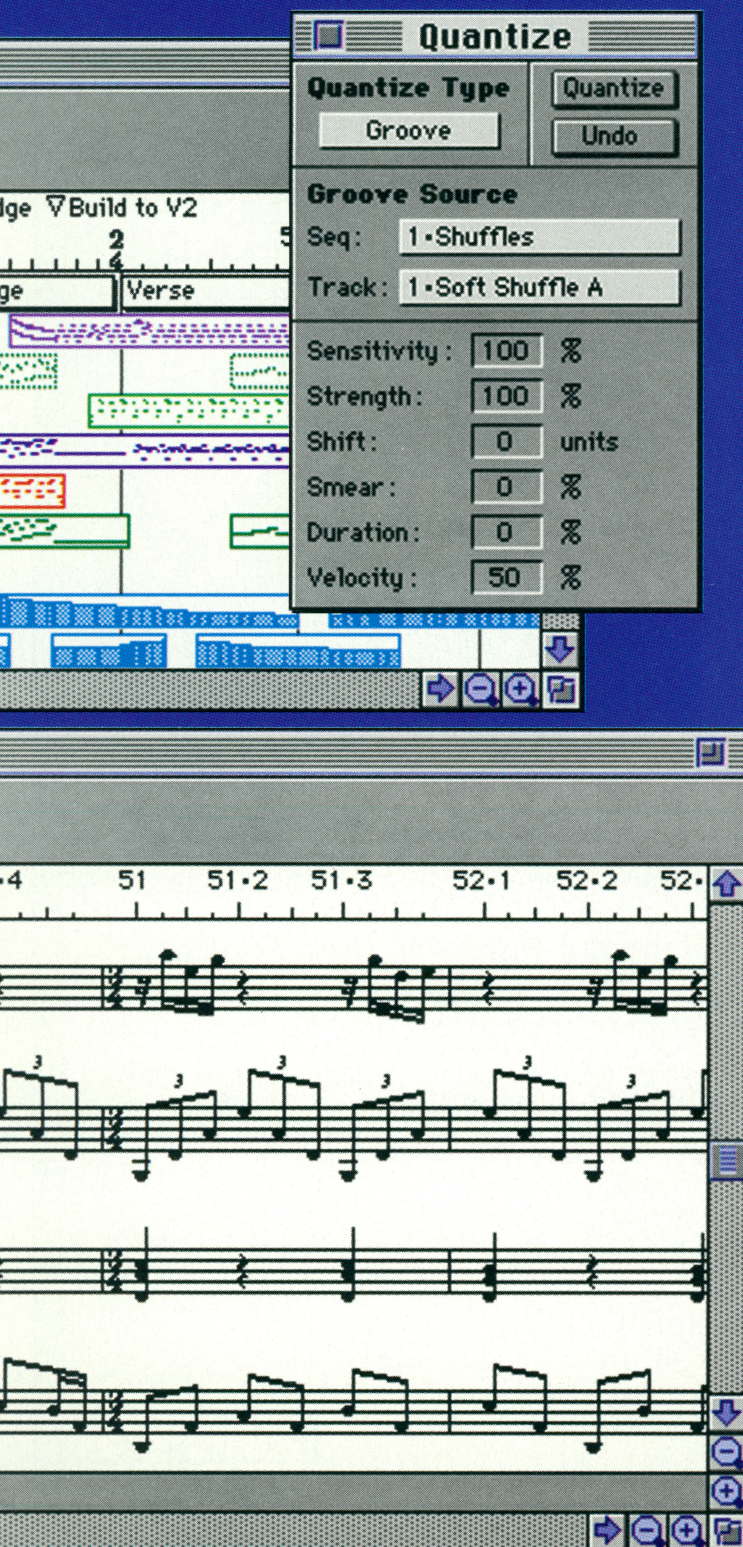
Proteus/2-4  
 VI 2  
 Proteus/2-3  
 Piano Chroma  
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[Musical notation staves showing notes and rests]

[Icons] Strip Chart... Exact



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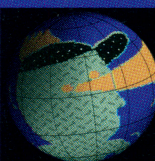
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# Dr. John

Continued from page 70

to upstage me whenever possible. He'd say *things like*, "Mac, I have a great idea. On the next gig, I'm going to get up and say, 'Dr. John, you stole all my music. I challenge you to a duel.'"

I looked at him like he was crazy. "What kind of duel? Pianos? Swords? What?"

He just looked at me and changed the subject. Another night, when we was playing the Aragon Ballroom in Chicago, I kicked off the set and Booker didn't show on the stage. Suddenly this big mountain of sound began to swell beneath us; we looked down, and there's Booker playing this big theater organ down in the orchestra pit. It was just roaring; the whole stage was moving. The pipe organ isn't an easy instrument just to sit down and play; he sat down and cranked it up like it was nothing. . . .

We were playing in Detroit, and Booker got us in deep heat with the motel management over his habit. I gave him two weeks' pay, and sent him back to New Orleans. Booker immediately went to Joe Tex and got two weeks' pay to join Joe's band; he went to Marvin Gaye and copped two weeks' money to join him; he went to Fats Domino and got two weeks' money from him. Then he took all the cash, copped a bunch of dope, and got busted. They sent him to the parish prison, where he sweet-talked the sheriff into bringing a piano in and giving him his own phone. In return, he entertained the sheriff.

We made a tape over there one day at the prison. We had the whole band, with Booker playing piano. Booker didn't last too long after that. He died while I was in Scotland in a hospital, suffering with a blood clot in my leg from shooting dope. Nobody told me when he died. I don't know if they thought I'd have a blood-clot-ism and croak or what, but only much later did I learn about Booker's lonely death. He had been taken and left in the Charity Hospital, where he was dumped in a wheelchair in the hallway, having taken too much cocaine. It stopped his heart. He lay in the wheelchair for a half hour; his body was still warm when they finally found him. But by then it was too late.

Booker could play it all — stride piano, butterfly, boogie, all the other New Orleans styles, the Chicago styles, the Memphis styles, the Texas styles, the California styles, bebop,

avant-garde jazz, classical, even pop! He'd sit down at the piano and play knock-out versions of all kinds of tunes — everything from Malagueña boogie to Bach fugues. There were just too many things Booker did that were so outrageously beautiful that I just can't see how he ended up like he did.

## Fess

Professor Longhair was the guardian angel of the roots of New Orleans music. He was a one-of-a-kind musician and man, and he defined a certain style of rumba-boogie funk that was New Orleans R&B from the late 1940s all the way through to his death in 1980. All New Orleans pianists today owe Fess. He was the guru, godfather, and spiritual root doctor of us all.

I first worked with Fess back in the late '50s at Cosimo Matassa's studio. A bunch of us — John Boudreaux on drums, Eddie Hynes on trombone, Morris Bachamin on trumpet, myself on guitar, and a couple of other players — fell into a session with him, during which he gave us a taste of his funky genius.

We began by recording his song "Hey Now Baby, Hey Now Honey Child." For starters, Fess sat down on John's drums and played what he wanted John to play. Fess was very specific about what he was looking for in the drums; John played it to death, and Fess was content. When we got to "Mardi Gras in New Orleans," Fess turned to the horn section and said, "What's ya'll doing? I want ya'll to make a 'spew.'" Eddie Hynes and Morris Bachamin looked at Fess, and I did too, because I was playing a lick with the horn section. "Fess," one of us said, "what the hell is a 'spew'?"

Fess vocalized it for us, singing the horn line to illustrate what he meant. At the end of the line, he said, "Speewwww!", and we got it. What he wanted was known as a "fall-off" by every horn player I've ever been around. And we said, "Oh, you want a fall-off."

"No," Fess said, real good-natured and sweet, "I want a spew."

We ran through the number again. Hynes and Bachamin gave him a fall-off, and he was happy.

A little later, on another take of the same tune, Fess turned to John Boudreaux and said, "John, that ain't what I want you to play on your foot propedeller."

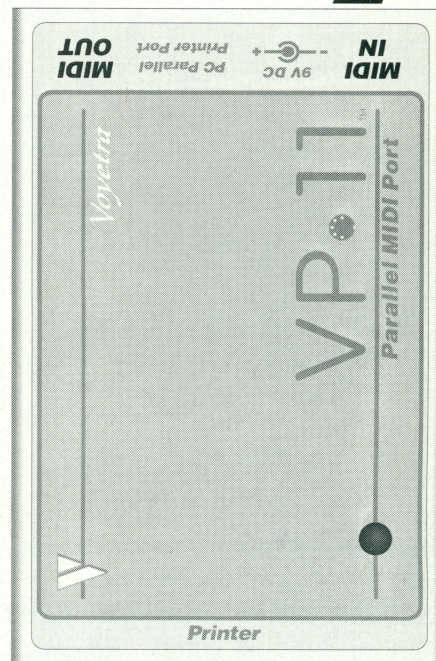
John said, "My whaaaat?"

Fess said, "You know, I want you to propel your foot with your foot propelacter."

Man, he would change it every time he called the foot pedal's name.

Then he turned to me. "Max," he said, "I

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# Dr. John

want you to distend your volume a little bit."

I just stared at him.

"You know," he said, "I want you to get more bass tonalities." I added some bass, and he said, "No, that's not what I mean," and we fiddled and played with the guitar for another twenty minutes till the sound corresponded to what he had going on in his head.

Finally, when it seemed we had "Mardi Gras in New Orleans" nailed, we were doing one last take when Fess suddenly changed one whole part of the song. He added a baroque embellishment to the changeover that looped a loop and callioped right back into the main melody.

Naturally, the band all blew it, had no idea that was coming.

Fess said, "Yeah, that's what I want. I want to make the double-note crossover approach."

So we ran that down with him till we got it; now the whole band knew it was coming, and he did the turnaround like that every take, just for us. . . .

During down times, when there was nothing to do, . . . I'd play him a little tune I'd written, and Fess was so hip — he'd build my spirits up, say, "Oh, play that again," as if he was intrigued by something I was doing. But he would do that just to get me charged up. I'd run through it again and he'd listen, then he'd say, "You know, if you do this. . . ." Then he'd turn my song into something whole. I'd get all excited, watching what he was doing like a hawk. After that, he'd sit down and play me a version of "Tipitina" because he knew that was my favorite song. These versions came out like concertos rather than the stomp-down boogies he'd do on a gig: He'd make a gorgeous thing and then he'd say, "Now let me see you play that one part." I'd try and he'd say, "No, now look, Max, you got to do this and that," and he'd make it real clear to me.

Fess had this one composition he never recorded that astonished me. He worked on it for years, turning it into a long-running improvisation of amazing depth and virtuosity. I kept urging him to record it, and he'd say, "One day I will, but I'm going to do it with eight banjos, two tubas, an alto tuba, and a trombone." He wanted to use the eight banjos as a kind of snare-drum-like battery,

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popping out a stringed syncopated rhythm. The tubas would make elephant calls. He'd howl them out to me. He even went so far as to take my guitar, stick a pack of cigarettes under the strings, and pluck out the chords so the guitar sounded like a banjo. I'd ask him, "Why don't we just use guitars to do it?" He'd say back crisply, "No, it got to be banjos; that's my snare." He had it sussed out that the banjo is built like a snare drum; you can pop the strings of the banjo and get *not just the snare* tap but also have the tones of the banjo strings. It was a thing that should have been recorded, but Fess wasn't going to cut it unless it was done in exactly the way he imagined. . . .

Fess was constantly experimenting, coming up with tricks and figures no one else could touch. One of my favorite things that he used to do was a lick he played on a Paul Gayten song, "Hey, Little Girl." He'd get to the V chord of that song, and in the bass line he'd play a minor note with his left hand against a major chord with his right, which totally reversed what anybody else would be doing. If the bass player turned it around and played major against Fess's minor, Fess would stop the band. He wouldn't point out who'd messed up, but he would make us all go over it till the bass player finally snapped and realized, "Oh, God, he's playing that minor." He had a way of letting you know it was you who'd fallen out without coming right out and nailing you and hurting your feelings. . . .

Fess just didn't give a piss what the people who were bad-mouthing him thought. He knew where he was coming from. He also knew a lot of them thought his action was raggedy because he smoked that herb. [But] when he came back into a joint after smoking one of those bomolatchees, you'd better watch out: He'd go into his "over and unders," elaborate playing action with his hands. People ate it up. And that wasn't his only unorthodox maneuver: The club owner had to put a board up under the piano, because Fess kept time with his foot. If you didn't put the board up under one of those old uprights, Fess would kick a hole in it. A lot of times he would play with just a couple of other guys, one playing the maracas, the other a snare drum. Fess's romping foot was the bass drum; it was part of the show. . . .

By making music the spontaneous way he did, Fess created something extraordinarily different and special. The shame of it was that he just didn't realize exactly how different it was. His songs were deeply felt spirituals with a rhumba-boogie beat, incantations to the jollamallawalla gods. I miss the man and feel blessed that he passed through my life. ■

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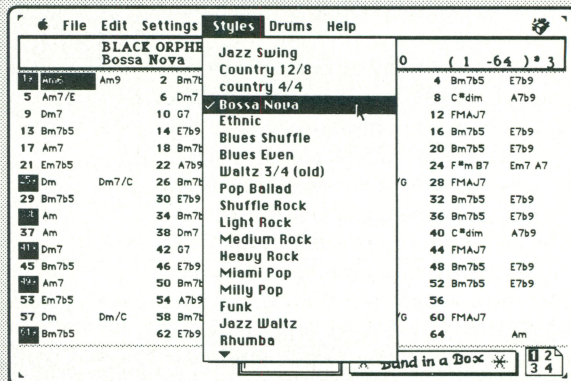
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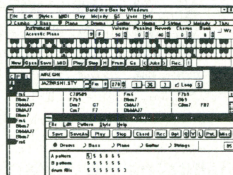
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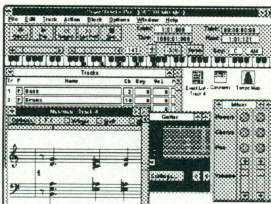
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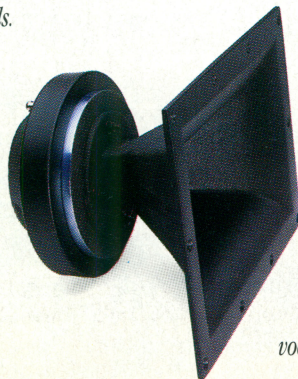
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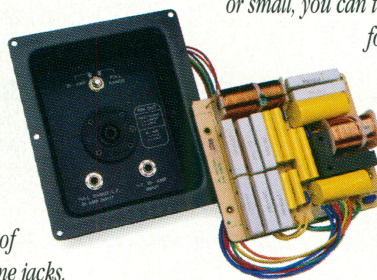
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# FROM THE INSIDE

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# LOOKING OUT — A

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# PROGRAMMER'S

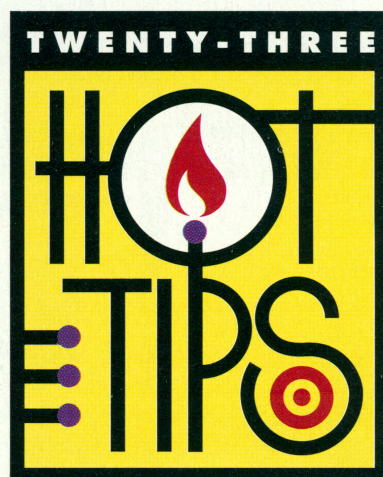
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# GUIDE TO THE

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# KORG 01 / W

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**M**ost of the 01/W owners that I've met use their instrument as a sonic workhorse, and learn only enough basic features to get around. But there are a lot of cool tricks waiting for you under the 01/W's hood. Hopefully the tips in this article will motivate you to

really tap into its power.

This clinic assumes that you have a general familiarity with your instrument. Most of the items are self-explanatory, but if you're not clear about a certain area, there's always the owner's manual. (You have read it, haven't you?) Note that the information presented here can be applied to all of the instruments in the 01/W line.

## OPERATIONAL TIPS

**Get Up to Date.** Turn on the 01/W while holding down the Reset button to display your instrument's operating system version. (Look for it in the left-hand side of the LCD.) Versions #62 and higher add some important new features, including support for Standard MIDI Files, a sequencer track solo feature, and

**B Y J O H N L E H M K U H L**



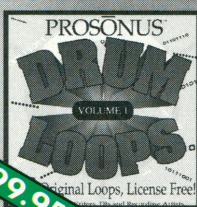
## Audio CDS:



Fat Fresh and Phunky, Drum Loops Volume 2 contains the latest dance and rap grooves from some of LA's hottest producers. Also includes the samples used to construct the Loops, DJ Scratches and Cool Percussion FX. Hip Hop, Industrial, Rap, Old School, New School and Techno- This disc is the perfect compliment to Volume 1.

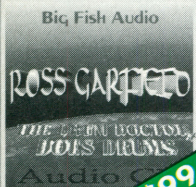
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500 Rap, Hip Hop, Techno, Industrial, Rave and Go Go Loops on One Audio CD. This disc was created in association with Chris Lang: "After years of programming in LA and Germany, I wanted to produce a CD featuring my best loops. Working with Big Fish Audio, I was able to achieve my vision of putting quality first." -Chris Lang



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This Sampling Audio CD contains the entire 1,200 stereo sample library of Ross Garfield. For years Ross Garfield's Drum Doctors has been the first and only call when the world's top drummers won't settle for less than **the sound**. (Jeff Porcaro, Terry Bozzio, Lars Ulrich, Chad Smith). Ross has also lent his expertise to sessions with Alesis, Bob Clearmountain and Ensoniq.



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Ambient, Progressive, Trance, Techno, House, Rave- These styles are rapidly evolving. Most of the synth loop discs on the market feature outdated synth and bass loops that would fit right into a cheesy commercial or a Sega video game, but just won't cut it in 1994. This disc is packed- over 70 minutes of trippin' **NEW** Analogue Grooves and Synth / Bass Loops. Rock on it.

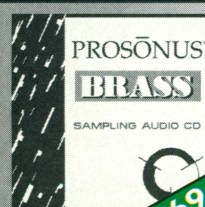


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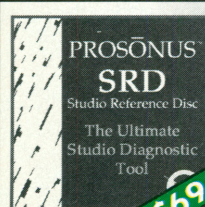
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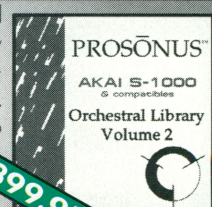
## CD-ROMS:



The Sound Designers involved with Ross Garfield's renowned collection have remained true to Ross' vision of a no compromise Drum Library. The CD-ROMs contain every sample in the Drum Doctor's library as well as exhaustive selections of kits and banks. Mapped in versatile GM format as well as kits that contain numerous articulations of each instrument. **Akai, Roland, Emu & SampleCell**

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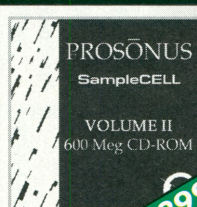
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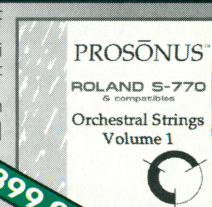
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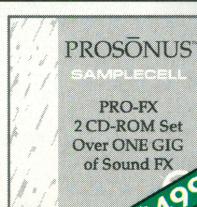
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the ability to disable the effects in the Global page. If you do not have version #62 or higher, any authorized Korg service center can update your 01/W for \$50.00.

**Memory Initialization.** To initialize the 01/W's internal memory — all Programs, Combinations, Sequences, and Global settings, including drum kit note assignments — hold down the Reset and Compare buttons while turning on the power. (This is an important tip for 01R/W owners who want to quickly initialize the battery-backed sequencer.) You'll also see the OS version number during the initialization process.

After initializing, you can go to Global page 7 and reload all or part of the factory Programs, Drum kits, and Combinations. (The factory combis won't sound right unless the factory programs are in their correct locations — but loading a combi into a bank that uses different programs can be a cool trick for creating new sounds.) Having the factory programs and drum kits stored in ROM lets you fill the RAM with data from PCM card sets or other custom sounds and access the factory programs when needed by loading them into RAM one at a time. (Think of it as having a second card slot that always contains the factory patches.)

**Getting Around.** I'll let you in on a secret: It's a lot easier to get around on an 01/W than you might think. Here are the keystroke shortcuts that can make life (or programming the 01/W, at least) much easier:

Instead of using the value up/down buttons and the slider to change parameter settings, you can enter these values directly from the numeric keypad. Hold down the appropriate softkey button A – H to highlight the parameter you want to change. While holding the button, enter the desired value with

the numeric keypad. (For text parameters, such as Poly/Mono mode, the 0, 1, and 2 buttons are generally used.) When you let go of the softkey, the new value will be entered.

To change from a positive value to a negative one (or vice-versa), hold the appropriate A – H button and push the 10's Hold/– button. If you are in Edit Combi or Sequencer mode, pressing 10's Hold/– while selecting a program will cycle you through banks A, B, C, and D (C and D are found only if a Program card is plugged in).

In Combination and Sequencer modes, split assignments are a snap to enter directly from the keyboard. On page 2 of Edit Combi, set the cursor on the Key Window Top (the line second from the bottom), hold down the softkey that corresponds to the desired instrument, and play the highest note of the range in which you want the instrument to sound. Use the same technique to set the lowest note in the range. (This works via MIDI on the 01R/W.)

Don't like your most recent edit? Any modified parameter can be returned to the stored value by simultaneously pressing the value up/down buttons.

**Maintaining Your Image.** When you set the pan parameters in a combination to "PRG" (page 1, Edit Combi), the panning assignments as set in the programs are used. To maintain the stereo imaging assigned to each note of the drum kits, you must also set the pan parameter to "PRG." (This is true both for Combination and Sequencer modes.)

**Editing a Program from Within a Combination.** Ever have a combination in which one or more of the programs needed some tweaking? In the past you would go to Program mode, call up the program you wanted to change, edit the parameters, save the new edit, then go back to Combination mode to hear the results. Well, those days are over!

Call up factory combination A01 "MIDI Piano." Hold the "A" button (to select the piano program) and then press Edit Program. This puts you in Program Edit mode, with the screen displaying the parameters of program B01 "8' Piano." Now you can edit the program, but when you play the keyboard, you'll hear the program in the context of the entire combination — complete with effects. Remember that any changes made at the program level will affect all combis that use the program.

**The Rec/Write Button.** This button provides a quick way to "update" (write to memory) a combination or program without having to go to the Write/Rename page. The restrictions are that this utility can only be used to update the current program or combination, and you can only write to the current memory location. If you want to write your

## WAVESHAPING BASICS

**W**aveshaping can be used to make PCM samples sound and respond more like acoustic instruments. You can also use it to create some pretty wacky synth sounds, or use it on drums to produce techno and acid effects. The following experiment should help you get a handle on how to make Waveshaping work for you.

Select factory program A96, "Bow Wow Bass." Next, press Edit Program and page up to the Waveshaping page. Notice that the bottom half of the display says "WS1=37 BowwBass," indicating the Waveshaping table used. Try selecting different tables, and listen to the effect — sometimes subtle, other times dramatic — that each one has on the sound. When you're done experimenting, select table 36, Pulse 5.

To the right of the table name are parameters for controlling the level of the waveshaping over time. The higher the level, the more drastic the modulation. Start by setting VS (velocity) to 99. Play some very soft notes followed by some very hard ones and listen to the difference. Now set S (start level) to 99 and DT (decay time) to 60. Again, notice the effect, which is similar to that of a low-pass filter envelope.

Let's reverse the effect. Set S to 0 and SL (sustain level) to 99. See how the sound swells and gets "brighter" over time? (Use DT to adjust the length of the swell.) Don't forget that the overall volume is still being controlled by VDA 1, so the sound may fade out before the Waveshaping is in full effect.

To see how the Korg voicing team used Waveshaping, check out factory programs A02 Orch. Brass, A08 ResiDrops, A31 Alto Sax, A18 Tidal Wave, A28 Syn-Piano, and A33 Sweet Oboe. ■

## ABOUT THE AUTHOR

*John "Skippy" Lehmkuhl works for Korg R&D and for the past five years has been a member of the Korg Inc. International Voicing Team. He really likes drums and things that get hit and make cool sounds.*





edit to another location in memory, hit 9 on the keypad to go to the Write/Rename page.

## THE SEQUENCER

Most on-board sequencers get panned before anyone has taken a good look to see just how powerful they actually are. The sequencer in the 01/W has many of the same features found in today's software-based sequencers, and is definitely worth checking out.

**Direct Data Entry.** The techniques described above for data entry from the keypad also work with the sequencer. For example, select VOL in the Edit: field, cursor up to the Volume field for the track you wish to edit, and directly input values to your heart's desire. Remember, too, that when selecting the program for the track, repeatedly pressing

10's Hold/- cycles among the banks.

**All About Panning.** For some extra animation in a sequence, it's great to have a track or two moving around in the stereo field (though I admit I got a little carried away on the 01/W Dance PCM card sequences using this type of trick). The 01/W sequencer can record MIDI controller commands for volume and panning in real time using either OVDB (overdub) or Loop Record mode. (Note that these controller messages cannot be recorded over MIDI, but must come from the 01/W itself using the data slider and the appropriate Edit: command.)

In the sequencer, panning moves show up as controller 10 data. Values between 000 and 100 determine the sound's left/right position in the stereo field. Values 110 through 115 assign the track's sound to output C; values 116 through 119 assign the sound to output D; values 120 through 124 assign the sound to outputs C+D; values 125 through 127 assign the sound to ALL.

**Comparing Notes.** When you record in OVWR (overwrite) mode, use the Compare button to toggle between the original and new takes. When the Compare light is lit, you are listening to the first take; when the light is off, you are listening to the most recent take. The same is true when you've edited

a track using Event Edit (page 5, Edit Song); use Compare to see if you like the results of your edit.

**Recording Tempo Changes.** It's easy to record tempo changes in real time. First, press the Rec/Write button. Next, change the field immediately to the right of the bpm display so that it reads REC (normally, this field is set to MAN). Cursor to the BPM field to highlight it, then start the sequence playing. As it plays, you can change the tempo using the data slider, the value up/down buttons, or directly from the keypad (don't forget to keep the A softkey pressed when entering values directly from the keypad).

You can also edit the tempo track in Event Edit. Select page 5, cursor to highlight Event Edit, then use the value up/down buttons or slider to select Tempo Track in the track selection field at the bottom of the page. (Tempo Track is the last option after track 16.) Next, press Rec/Write and Start/Stop simultaneously to enter Event Edit mode. To change the tempo, either edit an existing tempo value or press the [INS] softkey to add a new one.

While in Event Edit mode you can easily change the time signature as well. Simply highlight the Time Signature field and enter the desired value.

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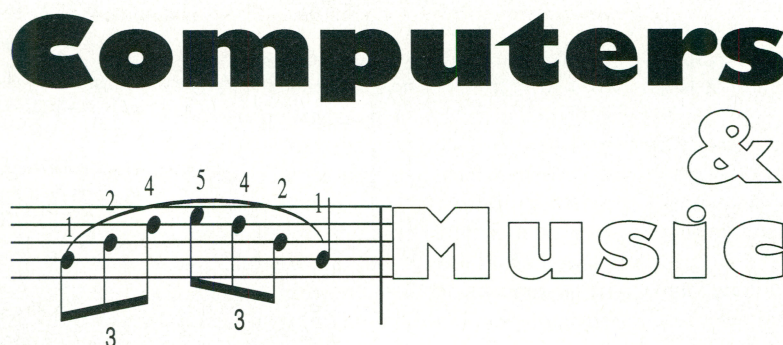
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**Hip-Hop Quantization.** The Quantize Intensity function (page 6, Edit Meas, softkey G) allows you to quantize your data while retaining as little or as much of your original feel as desired. A cool trick for creating a hip-hop groove is to record your track with the Quantize Resolution set to R:HI, then re-quantize the entire track with the resolution set to a sixteenth-note triplet and the Quantization Intensity set to 82%.

**Simple Track Setup.** A quick and easy way to assign programs, MIDI channels, key ranges, and so on to sequencer tracks is to use the Copy From Combi utility (Song, page 9), which lets you copy an entire combination into the sequencer — effects and all. In fact, you can actually copy two combinations — one for use with tracks 1 through 8 and the other for tracks 9 through 16.

**16-Way Multitimbral Operation.** When you're doing multitimbral sequencing using an external sequencer, assign programs to MIDI channels in the 01/W's sequencer rather than in a combination. This way, you can have the 01/W play on 16 MIDI channels simultaneously, whereas you'd be limited to eight channels in a combination.

**Tuning Drum Kits.** The 01/W's factory drum kits are programmed with a pitch-bend range of  $\pm 12$  semitones. This allows you to

get lots of different sounds from a single kit simply by adjusting its overall tuning. If you insert a pitch-bend value at the beginning of a sequenced drum track, the track will play at that tuning value until it sees a new one (which it won't, unless you've added another pitch-bend value at some other point in the track — also a cool way of getting a wider variety of sounds out of a single kit). To make a funky, tight-sounding drum kit, insert a pitch-bend value of +6,500 at the beginning of the track. For the big, deep, monster sound, a setting of -5,000 should do the trick.

**Copying and Pasting Events.** Yes, it can be done! To copy an event, you must first delete it; this places it in the edit buffer. Then, using the INS command, the event can be placed where desired in the track. Here's how it works: Select the event you wish to copy; press DEL (one time only) to delete the event and place it in the edit buffer. Now press INS; the event will be reinserted into the track. Scroll to any other location in the track, press INS, and a copy of the event will be inserted.

Copy Measure can be used to copy all 16 tracks to another location in the same sequence by setting the Source track to ALL. This technique is perfect for copying a verse or chorus to another location later in the song.

## EFFECTS PROCESSING

**Getting Real (Time).** Each of the 01/W's stereo effect processors allows you to modulate certain parameters in real time. The modulation source can be the data slider (when in Program Play or Combination Play mode), footswitches, the joystick, or even the volume of the sound. Study programs A16 and A64 and combinations A20 and A24 to see some different examples of real-time modulation. Whenever you see "FX1" or "FX2" in upper right of the LCD, it means that some controller or another is assigned to change that effect in real time.

**Sequencing with Effects.** In order to use dynamic effects in the sequencer, the Global MIDI channel and the MIDI channel on which you record the effects modulation must be set the same. I usually keep the Global MIDI channel set to channel 1 and record effects modulation on track 1, MIDI channel 1. I also record a drum track on track 1, because the factory drum kits don't have any modulation assigned, and therefore won't be affected by the mod data.

**Effects Routing.** The Parallel 2 configuration really helps you get the most out of the effects processors. Select Parallel 2 and

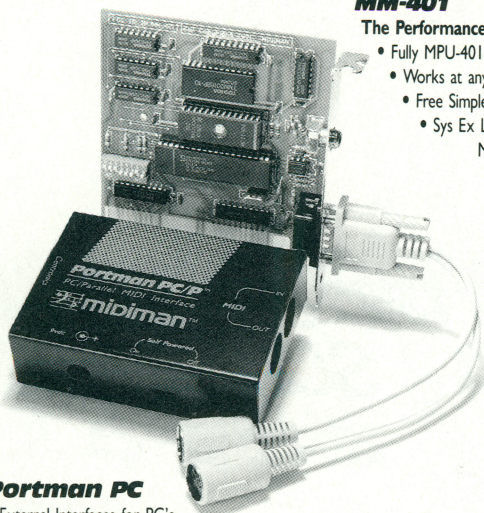
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assign a distortion effect to FX1 and a reverb to FX2. Set the outputs for Out 3=L and Out 4=R. In this setup, a program with a pan assignment of 5:5 (either in the program or the combination) will be processed only by the reverb, but one assigned to C+D will be processed by both effects. Check out factory combinations A14, A23, and B14 to see some of the more complex effect setups that use the Parallel 2 configuration.

If you're using all four audio outputs and are having problems getting outputs 3 and 4 to make any sound, the first place to look is on the Effects page. Make sure that the output assignments are set for Out 3=OFF and Out 4=OFF. The usual settings are Out 3=L and Out 4=R; these are used for internal effects patching, as in the routing outlined above.

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*Continued on page 153*

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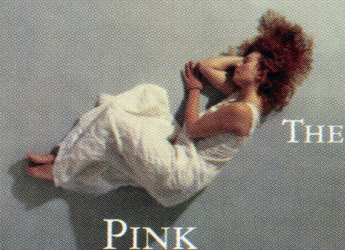
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# Trent Reznor

Wake up and  
smell the burning  
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In a time when synths have  
all but disappeared from  
the rock & roll stage, his  
electronic brainchild, **Nine Inch  
Nails**, is at the forefront of a  
technological revival

**"Maybe** keyboards are considered unfashionable these days, but I

don't give a f... " 🖐 Trent Reznor isn't one to mince words.

Since bursting onto the scene in 1989 with his Nine Inch Nails platinum debut

*Pretty Hate Machine*, he's proceeded to shock, offend, and, yes, amaze

us with his twisted brilliance. In his hands, vintage synths, guitars, and

raw samples become harsh, yet ingeniously crafted electro-metal landscapes.

Once-recognizable instruments are digitally stomped, scratched, and mangled

By Greg Rule







Photography: Marina Chavez



# Trent Reznor

into noisy byproducts using Digidesign Turbosynth and other, more fiendish sample-editing techniques — ultimately to be layered with Reznor's own tortured voice. Even though he makes no bones about his hi-tech allegiance, Trent Reznor has surged to the forefront in a technology-hating genre.

"I think keyboards have been given a bad rap in rock music," he says with disgust. "The Pearl Jams and whoever, that's not what I'm about. I like keyboards. I like technology. This is who I am."

In mid-1992, after a real estate deal in New Orleans fell through, Reznor flew to L.A. in hopes of finding the ultimate home studio site. And boy did he ever . . . the infamous "Charles Manson" Tate mansion. Considering his affinity for things abnormal, the match wasn't too surprising. What was surprising was the fact that he picked the place unknowingly.

"On a whim, I came out to Los Angeles," he says, sprawled across a sofa at the Record Plant in Hollywood. "It was a whirlwind tour: I looked at maybe 15 houses in one day, and at that time I had no idea one of them was the Tate house. No one brought that to my attention, even though they should have."

After closing the deal, and driving halfway across the U.S. from his digs in New Orleans, Reznor wasted little time in transforming the spooky confines into a high-tech showcase. Rooms that once witnessed the deeds of Sir Charles were now home to a new breed of dementia. *The Downward Spiral* (Interscope), the result of his Tate tenure, is aggressive, rude, inventive, and unpredictable. The lyrics are cold, and packed with references to such items as pain, sex, and disease. From the opening cut, "Mr. Self Destruct," a jagged aural assault reminiscent of "Wish," to "Closer," an electro-groove laden with 808 drums and watery bass lines, Reznor's vision is distorted, unnerving, and altogether brilliant.

"This was a difficult record to make," he grimaces. "I didn't have a definite idea of how it should sound. I mean, I had a theme lyrically and vibe-wise, but musically I wanted to put more emphasis into textures and mood, and not rely on the same bag of tricks. I had to develop a whole new palette of sounds to work with."

"Another thing that delayed this record

was me learning how to write again," he continues, "deciding what I wanted to do. I didn't want to make another *Broken* [Interscope]. I didn't want to box Nine Inch Nails into: 'Make every song harder than the last one, meaner, tougher.' I think that's a trap. That's not really what Nine Inch Nails is about. And I didn't want to go completely back to the *Pretty Hate Machine* style: percolating synth stuff. But I realized that when I sat down and started noodling around with ideas, I was much more inspired to sit at a keyboard than I was with a guitar."

A closet noodler Reznor isn't; he was classically trained on piano as a kid. And even though he doesn't like tooting his own horn, his studio chops aren't too shabby either. As a teen, he logged time as an employee of a Cleveland, Ohio recording facility, an association that ultimately led to the formation of Nine Inch Nails. Those unfamiliar with Reznor's past work might want to check out his hellish electronic stylings on *Pretty Hate Machine* and its six-song follow-up, *Broken*.

"With *Broken*," he explains, "I wanted to do something a lot harder than I did on *Pretty Hate Machine*. I wanted it to be a blast of destruction." *Broken* was made in secret because, according to Reznor, "we

"My idea of a drum is a button on a drum machine."

were in the midst of a legal tangle with TVT, our old record label." His signing to TVT (a.k.a. TV Toons, the company that brought us soundtrack compilations from the likes of *Gilligan's Island*), served to launch Nine Inch Nails' music. But in retrospect, the pairing of personalities couldn't have been more disjointed.

Today, Reznor is all too ready to kiss the studio world goodbye and get back to the altered reality of life on the road. A tour of Europe kicks off in April, followed by an extensive swing through the States. Keyboard spent a day with Reznor at the Record Plant recently and learned firsthand about the aches, pains, bumps, and bruises associated with a do-it-yourself record.



Why did you decide to make this record at home?

I wanted to fine-tune my engineering

skills; that's one thing we've always lacked in the Nine Inch Nails inner circle. I figured if I had a studio around, I'd inevitably figure out how to do it. And also, for the first time, we had the resources to do something right, so we ended up buying a big console and a couple of Studer machines because it was cheaper than renting, in the long run.

The project took considerably longer than anticipated. What happened?

We moved out here [to L.A.] on July 4, 1992. What we thought would take X amount of time to get a studio set up, ended up taking three times as long. As much as I enjoy equipment, fucking around with stuff, systems, and all that, there came a point where the whole focus was just to get the damn thing working and then learn it. Eventually I realized, "Okay, I'm sick of being in this room, now it's time to write an album." So I started writing, and by Christmas I had about four songs that I thought were decent.

Were there many gear snafus or other problems associated with working at home?

There were a couple pieces of gear crucial to the way the studio worked up at the house. One of them was a [Timeline] Micro-Lynx synchronizer. It syncs the two Studers, [Digidesign] Pro Tools, and everything. To be honest, it didn't work. Ten times a day we'd have to turn it off, unplug every cable, plug 'em back in, turn it back on, call the company, and, "Guess what? It doesn't work." There were many times when I thought, "Am I the only person in the world who's ever tried to hook these two pieces of gear, that they say work together, together?" So between that, and the terrible automation on the Amek board that we had, things would grind to a halt. I cannot tolerate equipment fucking up when you're trying to write a song, when you're on a roll. When you're in a [commercial] studio and something breaks, someone is usually there to fix it. When you're in a house, you're lying on your back under the board, scratching your head, trying to figure what the fuck. I mean, we can get people, but it might mean five hours of waiting around.

One danger when having a full studio in your house is: What do you focus on? I could spend, and have spent, a month just sampling things. So now, when it comes time to pull up a drum bank, it's all cool sounds that I've created, rather than leftovers from things I've used before. We spent a lot of time sampling and processing the sounds through different things. That way, when the actual writing and arranging moment came . . . when you went to reach for that bank of sounds, they were inspiring, instead of, "Fuck, I'm in the middle of writing a song, but I should really spend a couple of days



getting all new Oberheim sounds."

*What were some of the things you sampled?*

My assistant, Chris Vrenna, probably went through 3,000 movies, listening to them without watching them. Not to find the cliché spoken dialog sample, but just to hear sounds. He'd throw them on DAT, then I'd listen to them — I didn't know where they came from — and I'd cut 'em up into little segments and process them further through Turbosynth or whatever. We compiled almost **ten optical discs** of "things" like that. We'd do a new song: "Okay, what's the mood?" "It's grim." So we'd put up a bank, find a sound, and set it aside.

Another thing I did was . . . a guy came to tune our studio, and he had one of those real-time frequency/noise-generator things. So I sampled it. I think there's something strangely musical about noise. If you take a high frequency, and pitch it way down to where it's aliasing, you've got a pretty cool thing. You layer that into the mix and it suddenly becomes thicker, even though sometimes you can't necessarily hear it. A song like "Mr. Self Destruct," obviously you're going to hear it; it sounds like a vacuum cleaner running through the whole thing. But a lot of times it just thickens things up without being noticed as, "Oh, he's layering some noise in there."

*Let's get into the components of the record. Your drum tracks sound like a mixture of machines, samples, and maybe a bit of live drumming.*

Everything was programmed. My idea of a drum is a button on a drum machine. When I hear a real drum kit . . . when someone hits a kick drum, it doesn't sound to me like what I think a kick drum is. Any time I've been faced with, "Let's try miking up the drums," well, you put a mike up close, you put another one here, 300 mikes, gates, bullshit, overheads, bring 'em up and listen to it and it doesn't sound at all like it did in the room. It sounds like a "record-sounding drum kit." It doesn't sound like being in the room with live ringy drums. You read these interviews where producers will say, "It sounds like you're in the room with the band." No it doesn't. Nirvana's record doesn't sound like you're in the room with them. It might sound sloppy, and it sounds interesting, but it's not what it sounds like in the room, to me, anyway.

So we were experimenting with just two mikes, PZMs usually. We ended up taking a drum kit into about 25 different rooms —

from sneaking into live rooms at A&M Studios to bathrooms to living rooms to a garage, outdoors. We didn't close-mike anything, just put mikes in the same position about the same distance away from the drums, then hit each drum at several velocities and recorded them on a DAT machine. Then we sampled them all in stereo with velocity splitting on the Akai S1100s. I noticed that when you sat down and played those on a keyboard, they sounded exactly the way they did in the room: shitty, ringy, you know. When I programmed them, and even when they were perfectly quantized, they didn't

the same sequence.

*Did you use drum machines?*

Well, we sampled a Roland TR-808, as you have to these days. I try to avoid using it, but there's something about that low end. It's hard to beat that great low 808 kick. Actually, for "Closer," we sampled the kick drum off of an old Iggy Pop record, "Nightclubbing," off *Idiot*. Most everything was sampled, but I did use a Roland R-70, just because I wanted something that was a drum machine. I ended up being pretty impressed with its sounds, although they're somewhat generic-sounding. Good idea but terrible operating system.

*Toward the end of the song "Piggy," it sounds very much like live drumming.*

Okay, I confess, that one thing was live. For that part, I had a rigid, weird sixteenth-note pattern going. A kit was set up in the dining room, and I was playing along, fuckin' around, testing out the drums. I'd go in the other room, start the machine, run back in, put the headphones on, and play along. I couldn't hear it very good and I was way out of meter. So I just played as insanely as I could so I could hear how the drums were going to sound on tape. When I listened back, I thought, "Hey, that's pretty cool. Someday I'll come back and fix it." And of course I never did. That was it. That was the final take. A lot of what I do is accidental. I luck into things. I think that due to laziness — not coming back and fixing things — they end up becoming more interesting. My instinct is to repair, edit. "I'll get to it later." But then I'll get so used to hearing it, I'll end up leaving it alone.

*How much of this album was recorded to hard disk?*

Pretty much any real instrument like guitar or vocals or bass was recorded into the computer first; I use Opcode's Studio Vision all the time now for sequencing. Usually I'd loop something and then play along with it for awhile, then I'd go back and listen. If anything was decent, I'd cut it together into something cool. All the guitars I played were cut up and put together like that.

*Did you mike the guitar cabinets or go direct?*

I never mike cabinets. I've tried it, but I just don't like the sound that much — versus just going direct or through amp simulators. *Broken*, for example, had a lot of that super-thick chunk sound. Almost every guitar sound

"I don't use electronics as a cop-out: I couldn't get a drummer, so I just programmed it, or, I couldn't play this part good enough, so I programmed it. I program because I like the way it sounds. I like quantization, I enjoy the sound of it."

sound like a drum machine. And that, in itself, lent a strange, unexpected vibe to the thing. So on a few songs, we used that. I purposely made the drum programming very rigid, so that maybe someone will listen to it and think, "Is that a machine? Nah, can't be. No machine sounds *that* shitty." I like the idea of hearing a record and thinking, "That's guitar, bass, and drums," and then upon further inspection, "Wait a second, that's not what it appears to be." So that was one thing we did. And then sometimes, it was cool to say, "Well, let's see what those drums would sound like in the bathroom." So we'd load a different disk and use it with



# Trent Reznor

on that record was me playing through an old Zoom pedal, direct, and then going into Turbosynth. Then I used a couple of key ingredients to make it sound unlike any real sound in the world, and layered about four of them together. By then, it wasn't a guitar anymore. It's an awesome sound.

The great thing about the guitar as an instrument is its expression. It's much more expressive than playing a keyboard. Unquestionably, the controller/input device of the strings is a lot more expressive and accidental and uncontrollable. When you then can take that, and process it in a computer environment, you still get some of those elements of randomness.

*What are those "key ingredients" in Turbosynth you mentioned a minute ago?*

Usually I call up the Wave-shaper and click through a few of them, or "convert sample to oscillator" sometimes. A real low pitch can get you some insane sounds. I also use the modulator: Taking the sound as one input, getting the oscillator module, taking something with a real low frequency that has a bell tone or some odd harmonics, and modulating those two can usually produce some awesome death vocal or guitar sounds.

Also, for guitar, almost everything was put through a Zoom 9030. I don't like the distortion stuff in there — it's too traditional-sounding — but I really like the amp simulator. We also have the new Marshall rack-space head, the JMP-1 I think it is. It's a great-sounding head. So I take the direct out of that through the amp simulator in the Zoom, and you can get a pretty good, almost Pantera-ish power metal sound. I use that as a basis to start with, and since everything's recorded in the computer, it's easy to take it into Turbosynth and fuck around with it. Sometimes in real time, too. With [Digidesign] Sound Tools, I'll mess around in the parametric EQ window in real-time when it's previewing. It's also outputting digital at that time, so I'll hook a DAT up and record it while it's previewing, sweep through stuff, and get some insane distortion stuff. Load that back into Studio Vision and you have a performance of an EQ thing that you couldn't do otherwise. We do a lot

of stuff like that.

For "Mr. Self Destruct," we ran the whole mix through some old Neve mike pre's: a couple of channels of an old board. Those have great distortion; they're what I use for vocal distortion on almost everything. Those and the Zoom, which has a great ring modulator. I will say, though, that vocal distortion has become an incredibly cliché thing these days. It's become overused and uninteresting. But I think there are varying degrees of blending it in, or different effects that can come across. I want people to hear what I'm saying, but then again, I'm not interested in the great Phil Collins vocal sound. Maybe it's because I'm insecure about my own vocals. I don't know. But it's my record, and I'm gonna make it sound shitty if I want to.

*What are the roles of your various synths and samplers?*

Most everything is Akai samplers. I think the best thing about having some amount of success is the ability to get cool gear . . . *not* being bummed when some new sampler comes out that you know you can't afford.

**"I don't really like getting new synthesizers. It seems the emphasis now is building these all-in-one workstation same-sound ROM -playback bullshit things."**

So we have two S1100s, each one with an expander, so essentially four samplers. And that works out perfectly: One's almost always used for drums, one for miscellaneous stuff, and so forth, with quite a bit of memory in each one. Then it comes down to . . . I use the Minimoog a lot. I don't really like getting new synthesizers. It seems the emphasis now is building these all-in-one workstation same-sound ROM-playback bullshit things. I really kind of fell out of touch with what was happening until someone suggested I check out

a Kurzweil K2000, *which I did*, and bought. I think that's the only keyboard I've bought recently that's new, that I think is potentially awesome. I don't know all I should know about it, but we used that a lot because of the fact that it can read Akai banks. To me, that's kind of like real-time Turbosynth that's MIDI-controllable in a sampling situation. So we'll take a drum bank from the Akai, load it into the Kurzweil, and set up the programmable sliders on my MIDI controller to control some parameter that modulates something. On the song "The Becoming," all the drums were done with the Kurzweil like that. You could never do that in the Akai. I was also surprised at the amount of shit that's in there. In the day of preset piano sounds, it's incredible that someone put that much thought into an instrument.

*The bass sound on "The Becoming" was impressive.*

That was the "Ober-Moog," or whatever it was going to be called. I got it from Richard Bugg, my repair guy out here who was one of the guys designing it. I asked him, "Have you heard about this Oberheim-Moog thing?" And he says, "Yeah, I've got one out at the

house. Wanna borrow it for a while?"

"Bring it on over!" That thing is the fuckin' *greatest*-sounding keyboard in the world, because it sounds like a Minimoog *and* an Oberheim, and you can run each one through each other.

It doesn't quite work right, and unfortunately the project was scrapped, but that's what I used. It shows up in a couple of places mainly because I was getting bored using the Minimoog, which I've used for almost every bass sound I've ever done. So now I use the Minimoog a lot more for running stuff through its external input and through the filter. Aside from that, I still use the Oberheim Xpander, but it's role has decreased a little bit; I'm just kind of bored with it. And the Prophet-VS, I still use that.

I had a PPG when they were out, and I have a Waldorf MicroWave now.

If I go about trying to program that thing in a logical way, it comes out sounding like mid-1980s synth-pop — kind of dated, digital-sounding. But just through randomly generating stuff with Opcode's Galaxy, and I did this a lot on the Xpander and the VS, I'd generate thousands and thousands of programs. Then I'd hear an element of one that was cool, and fine-tune it. That may be a cop-out way of programming, but it was pretty interesting to find out, "What the fuck did it do to make it sound like that?" Then you go in and look and see what it did randomly. Every patch I have in the Waldorf is from that origin.



*You mentioned having difficulty with your synchronizer. Did you have any similar problems keeping your synths, samplers, and hard disk tracks in line?*

Not too much, really. Studio Vision was great — very few hassles keeping stuff together, in that respect. But we're not too anal about . . . if something is happening, we'll try to work around it. We'll figure out how to fix it later. We do a lot of stuff really sloppy on certain levels. On other levels, it's a very laboratory-like environment.

But problems? Sometimes I'd be in the studio and discover, "Why are all the vocals I've recorded suddenly in the wrong pitch and out of sync?" Then you realize that tape calibration somehow got turned on in Studio Vision — some mysterious element that changed the pitch and the tempo of the sequence and . . . it's gone, you'll never get it back at that point. You can diddle around with equations, pitch-shift everything down, slow it down X amount. Forget it. Go have a beer, come back the next day, and start over.

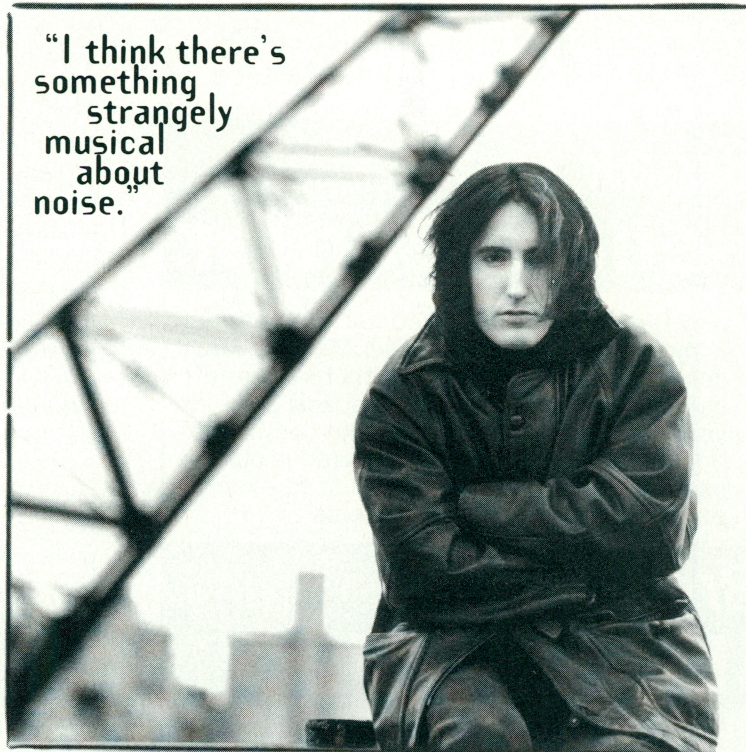
*What was it like working with Flood?*

Flood is an awesome guy, the best programmer I've ever been around in my life. You tend to work a certain way, which is very methodical — chisel away. "The completion of your record is so far away, don't even think about it. Just think about the completion of this hi-hat program." Then I read where Nirvana recorded and mixed an album in two weeks, and I'm going, "Fuck, that's gonna sell a lot more than mine is." There's got to be some balancing. So the next record I'm gonna do is going to be one that's a lot more spontaneous. One that better hides the horrors of technology, which can bog you down to a crawl. Many a time I've been sitting in front of an Akai with its ridiculous, archaic operating system trying to put these 400 samples into this keygroup and . . . "Why am I doing this? This is stupid. Why haven't I hired someone to do this for me yet?" That's another thing that led to the delay in putting out this record: getting bogged down in the studio. "There are 40 things I could do right now. I could write a song, which is the most important, or I could sample drums, or I could try EQing this, or programming that," and so on. It's lacking the discipline and fo-

cus to say, "Forget all the fun stuff. I'm going to sit down and write a song."

*In addition to the familiar NIN suspects, did you collaborate with any other outside artists?*

We had [guitarist] Adrian Belew come in just to see what would happen. He showed up, and, "Hi, what do you want me to do?"



And Flood and I were like, "Well, we don't know." So he looks at us, scratches his head, "All right, what key is it in?" We look at each other, "Hmm, not sure. Probably *E*. Here's the tape, do whatever you want to do. Go!" So he started noodling around and . . . Adrian is the most awesome musician in the world. I've never seen anybody play guitar like that.

*How are you going to pull this music off live?*

Well, the thing I learned from the last tour . . . the dilemma that I faced was: I didn't want to have three guys onstage, faking everything, with a tape machine running. However, I also didn't want a seven-piece rock band where every cool bit of electronic-ness was converted into people approximating it live on other instruments. I don't use electronics as a cop-out: "I couldn't get a drummer, so I just programmed it," or, "I couldn't play this part good enough, so I programmed it." It's not that kind of thing at all. I program because I like the way it sounds. I like quantization. I enjoy the sound of it. I like using those elements of perfection amidst randomness. And live, I didn't want that element to be brushed

under the table by a big live band. So we used four tracks of tape and four musicians: I'd play guitar on some songs, and sing, plus a keyboard player, a guitar player, and a drummer.

At the time there were no digital four-track devices that were affordable to us, so we just used a four-track cassette deck — high-speed

Tascam special. One track would be a click that the drummer would play to; he'd wear headphones onstage. One track would be bass, because 90 percent of the bass was synth, and I wouldn't want a real guy playing a bass, simulating that, nor would I want to see a keyboard player tapping sixteenth-notes out with his head down. And the other two tracks were stereo miscellaneous. Maybe it would be a percussion loop. Maybe it would be some sequency-sounding keyboard part. Stuff like that. And all the drums, vocals, main keyboard parts, and guitars were being played live.

I don't feel like I have to justify why we used tape onstage — I've always admitted that, and I will admit that we're go-

ing to do it again on the next tour — but the point was, that was the best way to get the stuff across live. That was the best way to maintain what was good about the electronic side of it. I didn't want to take sequencers and shit out live: "Excuse me, ladies and gentlemen, while I get on my back and get under the keyboard rig and figure out what MIDI cable isn't plugged in." I mean, we had enough problems with the one piece of gear that can fuck us up: the tape deck. We had a lot of problems with that. The only MIDI onstage was from triggers on the drum kit. The keyboard player just had an [E-mu] Emax; he'd load a disk for each song.

*Did you ever feel inhibited, improvisation-wise, by using tapes?*

Obviously you can't extend the end of a song, but I've never done that anyway, so I don't miss it.

*What will the lineup be for this tour?*

Since we never played most of the *Broken* stuff out live — which is way heavier on guitar, and I don't want to be bogged down playing complicated guitar parts and singing — I've got Chris Vrenna on drums, James Wooley



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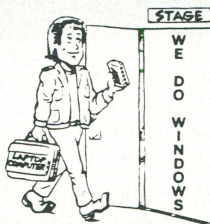


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# Trent Reznor

on keyboards, and two new guys, Danny Lohner and Robin Finck, each of whom is a guitar player/keyboard player/bass player. They're the best musicians I've had involved in the band so far. I even foresee moments when everybody is playing keyboards onstage.

*Are you planning to take an ADAT, DA-88, or whatever, on tour this time?*

Yeah. That's the plan right now. We're testing both kinds to see which one is more roadworthy. But essentially, my band can play more now, so the decision to move to eight tracks is based purely on the fact those machines are digital and available, and not because we necessarily need more tracks. I mean, we are going to experiment with some things like putting timecode on it, and we're orchestrating a production where some cues could be timecode-based to some lighting stuff. Not a totally automated light show, but there could be things . . . this is all hypothetical, but we're talking about some back speakers for surround things where a couple of tracks on the tape could be used for certain effects. One thing is certain: I'll never go back out with a fuckin' Tascam cassette deck which has the irritating problem of stopping whenever there's a voltage spike or anything. That has led to a few problems with us onstage.

*Care to expound upon any of those hellish gig experiences?*

Opening day, Lollapalooza, Phoenix. We couldn't play because one of the power boxes had melted, and every time the low end of the P.A. would rumble, it would jiggle the cord and all power onstage would just shut off and turn back on. If you have a sampler, that means you're down for a minute. And if you have a tape deck, ahem, that means it stops. But I think because we were an "electronic" band, everyone was just waiting for us to fuck up onstage. So this started happening and: "Hello, does anybody know what's going on?" A voice from backstage: "No, but I think it's working now." Turn to the crowd: "Okay, hey, we suck, so here's our next song." And ten seconds into it, every time he hit the kick drum, there it went. Turn back around: "This is the biggest show we've ever played, does anyone know what the fuck is wrong?" Voice from backstage: "We think we have it!" Turn to the crowd: "Okay, one more time," and . . .

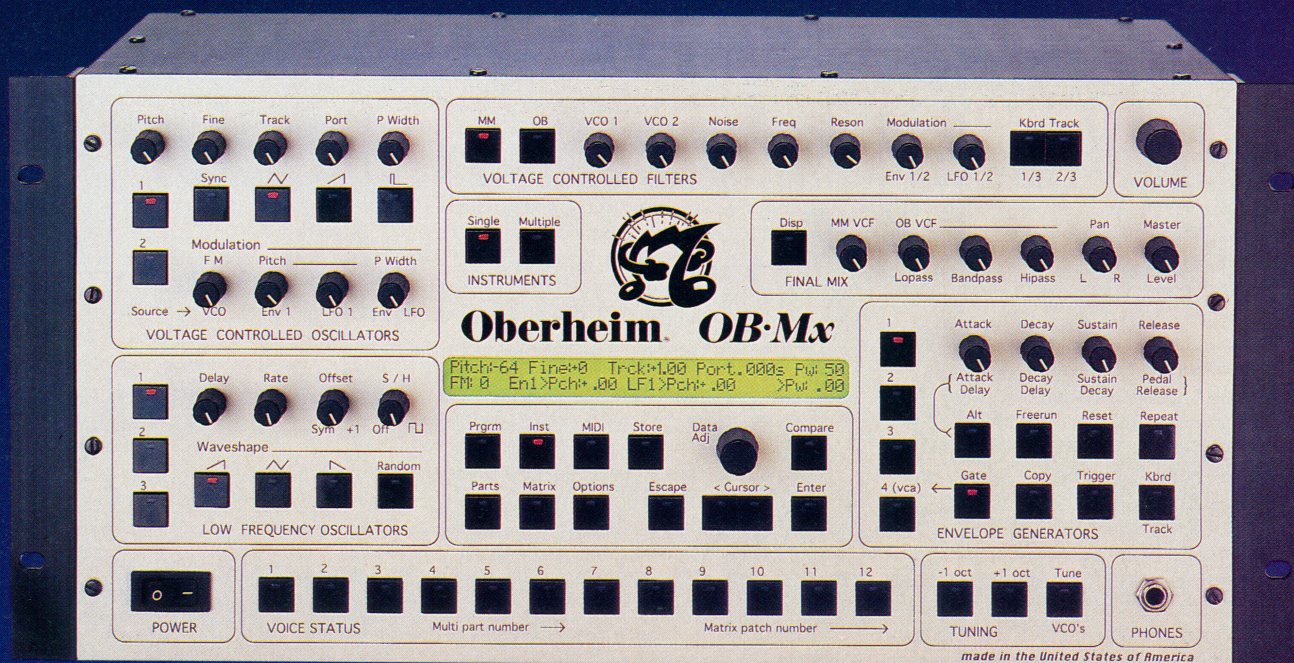
*So what did you do?*

We smashed all the gear and ran to the bus.





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## E-MU MORPHEUS

### SYNTHESIZER MODULE

By Jim Aikin

**B**ACK IN THE LATE '70S, IT USED TO be fashionable among a certain type of jazz fan to lament that nothing new had happened in jazz since John Coltrane. If you said to one of these snobs, "What about Keith Jarrett? What about Weather Report?" they would look down their noses and say firmly, "That's not jazz."

Bear this point in mind: If it changes, it's not the same.

More recently, synthesizer players have been complaining that the current generation of sample playback synths with built-in effects all sound alike. The truth is, there are a number of options out there for those who crave fresh sounds — wave sequencing (Korg Wavestation and Ensoniq TS-10), sample/FM hybrid (Yamaha SY99), intermodulation between waves (Roland JD-990), and so on. While all of these options have found niches and devoted users, none has caught on to the point of transforming the musical landscape the way sample playback did. A big part of the reason is because people *want* their synthesizers to sound like real trumpets and drums. Sample playback is pretty good at delivering realistic emulations of acoustic instruments. When people say they want something new, apparently they mean that they want it to sound radically different and exciting and fresh . . . but it still has to sound as detailed and realistic as sample playback. They want it to change, but they also want it to stay the same.



So here comes E-mu with a fairly hefty departure in instrument design, the much-anticipated Morpheus. In their Proteus line, they've pretty much nailed sample playback. Rather than make yet another Proteus, which would be sort of pointless, they've redefined the way filters work. And guess what? The new approach doesn't sound like sample playback any longer.

This is a two-edged sword. Morpheus gives you a whole palette of sounds that are subtly or radically different from those generated by electronic instruments in the past. Our best guess, though, is that in order to use these sounds in musical contexts, Morpheus owners are going to have to rethink, in subtle or radical ways, their arranging and orchestration chops. If you plug Morpheus in and expect it to sound exactly the same, only different . . . well, that strategy may work, or it may not.

**First Impressions.** Many of the factory presets in Morpheus have a rich, swirling character that invites you to grab a few notes and let them sustain. Comparisons to Wavestation pads are hard to avoid. The more solo-oriented presets often have a markedly electronic character, with a pronounced filter response to velocity. And there are *lots* of scary special effects patches.

Lots of patches, period. Start stepping through them, and after you go from 000 to

127, suddenly you're in a second bank that starts at 000 . . . and then a third, and a fourth, and a fifth. Banks four and five are available only when a memory card is inserted in the front panel. There's still no PCM waveform card slot — after all, this *is* E-mu we're talking about. But it turns out that Morpheus has an internal socket suitable for an 8Mb plug-in waveform ROM. E-mu has announced no marketing plans for this socket, but they wouldn't have put it there if they didn't intend to use it.

Next thing we noticed: Hey, this box has built-in effects. They're similar to the effects in the Proteus MPS keyboard synth — not ultra-powerful, only basic reverb and so on, but this is the first time E-mu has offered effects in a rack-mount synthesizer. Next: One of the preset banks (two banks if you've got a card inserted) is strictly for splits and layers. E-mu has gotten rid of the old "link mode" implementation in the Proteus in favor of a much more capable multi layout consisting of 128 programmable "Hyperpresets." (The MIDI multi mode is separate from the split/layer Hyperpresets, by the way. Any of the latter can be used on a single MIDI channel, just as if it were a single preset.)

The biggest treat was yet to come. When we nudged the mod wheel while playing a few notes, Morpheus started to speak to us. Almost literally. Complex resonant filter sweeps caused some very animated changes in timbre, all under real-time control. In some of the presets, the change in sonic character virtually transformed the nature of the sound — from piano to vibes, for example. The mod wheel will do a lot more than filter sweeps, however. Hey, is that real-time panning? Another advance over the Proteus. Some of the preset modulation shapes sounded way too complex to be generated by mere LFOs. Definitely a box that we wanted to delve into more deeply.

Some things haven't changed. The Morpheus uses the same two-line LCD as the Proteus — not exactly the lap of luxury, but serviceable. The operating system works in almost exactly the same way, except for the new parameters that have been added, so Proteus owners should be able to use Morpheus without even cracking the manual. One dynamite addition is the copy button, which assists programming by allowing you to block-copy many different types of data.

**Concerning Filters.** What makes Morpheus tick are its audio filters. These go far beyond the familiar lowpass/bandpass/highpass paradigm that synth programmers know and love. Morpheus filters can have a number of peaks and notches, and sweeping a filter with a real-time control source can cause the peaks and notches to move around independently. This adds greatly to the richness of the sound. (For more on the Morpheus's filters, see "The Next Big Thing" in *Keyboard*, Feb. '94.)

There's no getting around it, though: Filtering is by definition a method of subtractive synthesis.

## E-MU MORPHEUS

**Description:** Digital synthesizer module.

**Memory:** 128 ROM patches, 128 user-programmable RAM patches, 128 16-way split/layer RAM multis, 16 multi-channel receive Midimaps. Four user MIDI program change maps. 197 preset filter configurations. 8Mb waveform ROM mapped to 242 waveform selections, including drum kits, multisamples, and single-cycle waves. Five factory preset tunings, one full-keyboard user-programmable tuning. 8Mb internal SIMM socket allows for future waveform ROM expansion.

**Features:** Digital filtering with up to seven resonant peaks and notches per filter. Real-time interpolation ("morphing") of filter settings. Preset drum kits available as multisamples. Copy utilities for many types of data. Additional function generators available for coordinated modulation in splits and layers. Built-in dual effects processor. Four assignable MIDI controllers. Responds to mono and poly aftertouch. Card slot for patch data.

**Voice Architecture:** Two oscillators, three AHDSR envelope generators, two LFOs, two 14-pole multi-stage filters, two 8-stage rate/level envelopes with conditional jumps, 20 modulation routings per patch. Sample loop offset, delay, sample start offset, key crossfade, double/detune. Choice of voice trigger priority schemes in mono mode.

**Interfacing:** Front panel headphone jack (1/4"). Main audio outs (L/R stereo pair), four sub outs with TRS jacks for effect send/return mixing to main outs (all 1/4"). MIDI in, out, thru.

**Dimensions:** 19" x 9" x 1-1/2". 7 lbs.

**Suggested Retail Price:** \$1,495.

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*With its 14-pole filters, the E-mu Morpheus sends sample-playback synthesis flying through the roof.*

What this means is that if a given frequency is not present as an overtone in the raw waveform, the filter will have no effect at that frequency. The Morpheus filters work most impressively with waveforms that have a lot of prominent overtones. A classic sawtooth wave, for instance. Yes, in taking a step forward, Morpheus also takes a step back to the thrilling days of yesteryear. Many of its most striking sounds are rich, expressive digital variants on analog sounds from the '70s. The waveform ROM includes a long list of single-cycle waves that are ideal for this type of synthesis. (It also includes a select palette of familiar multisampled acoustic instruments — grand piano, flute, steel-string guitar, choir, drums, and so on. We'll have more to say about them below.)

Programming a synthesizer is a pretty complicated business these days. Just imagine how much fun it would be if you had to define up to seven peaks and notches for the filter section and how each peak or notch responds to a modulation input. Depending on how you look at it, either E-mu dropped the ball, or they took pity on Morpheus owners. Rather than provide access to all of the filter parameters, they created 197 preset filter definitions. At the programming level, all the user does is choose one of these filter types for each waveform.

The manual provides a brief description of each filter type, so you're not entirely flying blind. Included are conventional lowpass types with resonance, flanging types, multiple notch filters, resonant highpass, distortion, and much more. Also, in addition to choosing a filter, you

## PROS & CONS

**Pros:** Rich palette of fresh sounds. Function generators can produce complex modulation shapes.

**Cons:** Filter parameters are not fully programmable. Very limited effects programming.

**Bottom Line:** Terrific techno tool.

get to program its offset (more or less equivalent to filter cutoff in a conventional filter, although in Morpheus the offset can affect various peaks and notches in different ways), keyboard tracking amount, and, for some filters but not others, the offset of a second transform axis.

A second axis? Right. Depending on the filter type, you can think of the Morpheus filter as occupying a conceptual space shaped like a cube (see Figure 1), with separate settings for the parameters at each of the eight corners of the cube. In response to your performance input (velocity, mod wheel, aftertouch, and so on), the filter's characteristics — that is, its audio response — will sweep through some sort of trajectory within the cube. The amount of resonance for a given peak may be one of the parameters that gets modulated, along with the frequencies of the peaks and notches and the sharpness of the cutoff slope.

As convenient as it is to have preset filters, the diehard synth programmer is bound to wish for more control. In our first experiments with Morpheus, we found that it was almost a crap

shoot choosing which filter to use with which waveform. You switch among them at random, play a few notes, and stop when you find something that seems evocative. Then you set to work refining the sound by adjusting the modulation source(s) and depth(s) routed to the filter, and tweaking the offset parameters. Quite a few of the combinations are attractive, and the modulation sources, about which we'll say more below, definitely go the extra mile, but if you find yourself thinking, "Gee, this would be great if there were just a taste more filter resonance," you're stone out of luck, because the resonance amount is not user-programmable.

Don't get us wrong: Having preset filter templates is great. But they ought to be available as starting points for programmers, not as black boxes or cards that are dealt face down. Professional third-party sound developers *do* know how to use esoteric filter parameters to advantage — and they're the ones who provide 95% of the sounds that the rest of us use to make music. It's hard to understand why E-mu would build such a powerful instrument and then make





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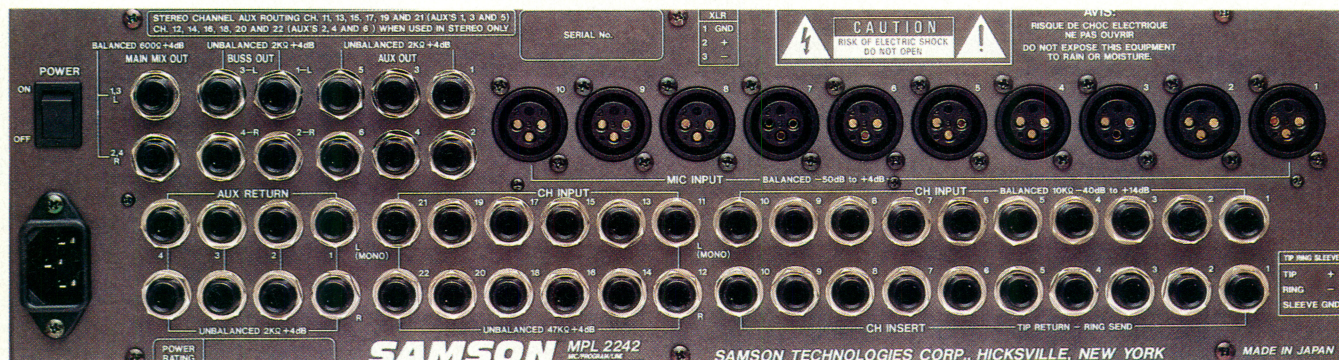
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## E-MU MORPHEUS

it harder for programmers to support it.

A related and perhaps more serious issue for sound programming arises out of the black-box nature of the filters: Morpheus offers no way to program variable gain compensation as a function of the depth and axis of filter modulation. Hmm. . . . I can't believe I just wrote that sentence. It looks like gobbledygook, but it isn't. Allow me to explain.

Pick a Morpheus waveform, and a filter, and then play a chromatic scale up the keyboard. Quite likely, you'll discover that certain regions of the keyboard, or even certain individual notes, are markedly louder than others. These are the places where the louder overtones in the waveform coincide with hot peaks in the filter. You can try to deal with the anomaly by changing the filter tracking parameter, but this may only move the loud spot over a few keys — and at the same time it's likely to drastically alter the character of the sound in other regions of the keyboard, regions that you're quite fond of, and don't want to change.

The same thing often happens when real-time filter modulation is used. Push the mod wheel while playing a note, and you may run into a hot spot that jumps out of the speakers, followed closely by a dead spot where the sound is *très* wimpy, all within a quarter-inch of travel of the wheel.

If you're working in a thoroughly qualified pro studio, there's a magnificent kluge that will solve the problem, at least with monophonic parts: Run each oscillator in a patch through its own audio output, and then through a compressor. That's what I meant by "variable gain compensation." Ideally, some sort of compression algorithm ought to be included in the filter software itself — but who knows how much that would cost the end user by the time it was engineered and built? Better we should be grateful for the new synthesis resources, and accept the fact that Morpheus comes closer than previous synths to meeting one of Brian Eno's desiderata for an electronic instrument. He once complained in a *Keyboard* interview that synthesizers sound sterile because they're too uniform. He wished for an instrument that would be "somewhat idiosyncratic from key to key." Brian — meet Morpheus.

Think of it as a new horizon in synth programming. Part of getting a great sound out of the Morpheus is knowing what key you're going to be playing the song in. We've never had to do this sort of thing before, but it probably won't be the last time.

One more observation about the filter setup, and then we'll move on. When you modulate the filter in real time, the response of a few of the presets sounds somewhat grainy. Push the mod wheel slowly and you may even hear readily audible stairstepping. This effect seems to be dependent on exactly which filter(s) and waveform(s) are in use in the patch. The more resonance is used in the filter and the greater the modulation sweep, the more pronounced the stairstepping is as the filter moves from one

set of values to the next adjacent set. If you should notice this phenomenon, check whether your MIDI controller is actually sending out all 127 values across the range of travel of the wheel or slider. Some popular devices (notably the Roland paddle) are deficient in this respect. According to E-mu, the internal control resolution of the filters is 256 steps, which is twice the 128-step range of MIDI controller data. We can't help wishing some sort of smoothing algorithm had been included in the filter's response to mod-

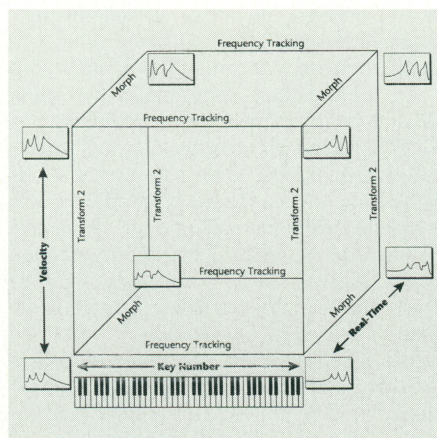


Fig. 1. The sound of a single Morpheus filter preset depends on as many as eight separate filter definitions, shown here as the corners of a cube, as well as three values — track, morph, and transform — which correspond to the X, Y, and Z axes in conventional geometry. Now aren't you glad you were paying attention during math class?

ulation. If you're playing techno, though, you may even like the slightly rough quality of the modulation in these particular presets.

**Catch a Wave.** To know a synthesizer, you have to get acquainted with its raw wave data. Because it's not a me-too instrument, Morpheus takes a slightly different tack in the waveform department. Multisampled acoustic piano, rock organ, and steel-string guitar were included, along with vibes, flute, sax, a variety of basses both acoustic and electric, and a big toy chest full of kick-ass drums. Missing from the list are such items as DX electric piano, harpsichord, solo brass, jazz organ, nylon-string guitar, and the ever-popular sitar. If you insist on these sounds, there are plenty of instruments you can buy; E-mu had other fish to fry.

The Morpheus wave set provides a number of rich pad-type samples with long, lushly animated loops — choir, brass ensemble, string orchestra, synth pads, and tuned noise. A couple of the loops are bumpy, but most are very smooth. The next category includes classic analog synth waves with short sampled attacks — several Minimoog samples, and some E-mu modular waves as well. You'll find quite a variety of single-cycle electronic waves, many of them holdovers from the Proteus and E-mu's Procussion. There's even a "barber-pole" multisample, which ascends continuously as you play up the keyboard while always staying in the same octave.

Several full drum kits can be selected as single "waveforms." These kits are in fixed layouts; Morpheus offers no drum kit programming *per se*. This means that you can't adjust the panning, loudness, or tuning of individual drums, and that the closed hi-hats don't cut off the open ones. All of the individual drum samples are available as single waveforms, so you could construct a kit as a Hyperpreset (see below) and get individual control over up to 32 drums. When you first select a single drum waveform from within a regular patch, you may be confused to hear a "hi-hat" that produces only a buzzy sustained note. To hear the full drum sample, you have to scroll over to the Loop Enable parameter and switch it off. This is not a problem; on the contrary, it's a way of getting more mileage out of the waves. Pumping a drum kit through the Morpheus filter array is a terrific way to get fresh percussion timbres, by the way. A basic conga sample can turn into a sparky snap or a woofing bonk — or fade between the two depending on how hard you strike the key.

When we auditioned the steel-string guitar and the piano, the default envelopes seemed way too short to us, so we turned on the alternate envelope. We found that the unnaturally short envelopes were being used to mask some questionable loops. It's best to think of these multisamples as providing familiar attacks that will then blend into a more Morpheistic sustain. Don't try to turn them into solo instruments. Morpheus does allow the courageous to attempt to dial up a smoother loop, but the loop offset parameter will affect the whole multisampled keyboard layout, not just a single sample, so it will be useful in this situation mainly if the part you're planning to play is restricted to a narrow region of the keyboard.

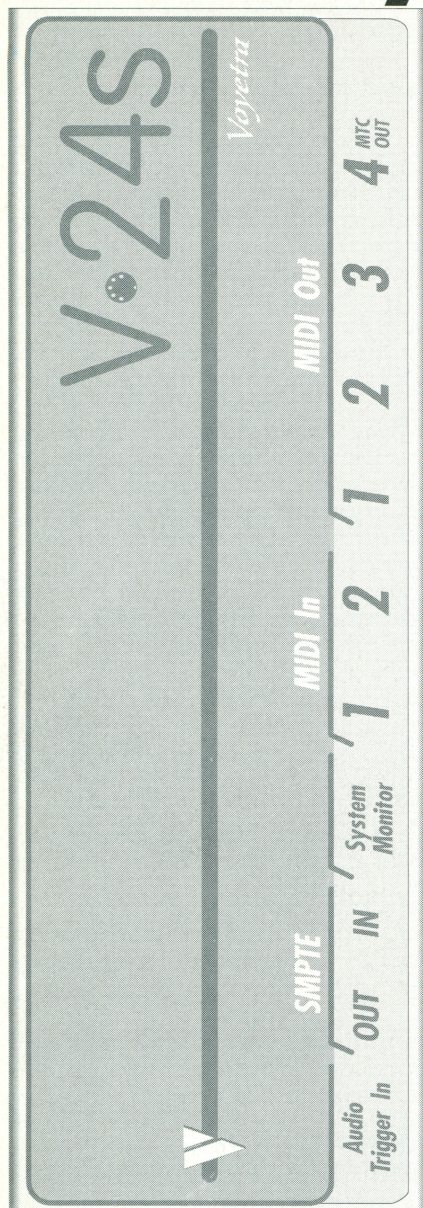
**More About Sound Programming.** We aren't going to spell out every voice parameter in the Morpheus, but a few items are definitely worth comment, especially the function generators. These modulation sources offer some unique dimensions of power. And then there's the loop offset function. . . . But before we get into that, let's outline the basics. If you're new to synth programming, "basics" may not be quite the right word. This area of the instrument has an intimidation quotient as high as its power rating.

A Morpheus patch uses one or two oscillators. Actually, either or both of these can be doubled and detuned from itself, which will create a warm chorused sound but will use up more of the instrument's 32-note polyphony. If you need to create a sound that uses three or more individually programmed oscillators, you'll need to use two patch locations for it and create a layer in Hyperpreset mode (see below). Each oscillator has its own settings for all of the voicing parameters, including filter type and amplitude envelope. Within a patch, the two oscillators share LFOs and a common bank of modulation routings. (You don't have to modulate both oscillators at the same time — you can choose one of the two as a modulation destination. But this will use up one of the 20 total modulation routings.)

Proteus users will recognize the five-stage



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## E-MU MORPHEUS

AHDSR envelopes. (The "H" stands for "hold," a stage designed to let percussive attack transients play in their entirety at full volume before the envelope's decay segment begins.) In addition to the amplitude envelopes, a single auxiliary envelope is shared by the two oscillators as a modulation source.

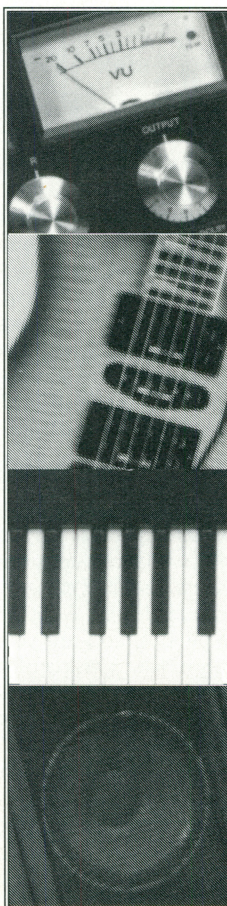
Each oscillator has not only coarse and fine tune parameters but also a transpose (*i.e.*, MIDI note number offset). By tuning the coarse tune up two octaves and the transposition back down by two octaves, you effectively shift the multisample split points without altering the pitch of the keyboard. With multisampled waves, this can produce tight, tweezy attacks or muffled, breathy gongs — great for exotic effects.

Like Proteus, Morpheus allows dynamic, real-time crossfading between the two oscillators in a patch. Keyboard zone crossfading is also supported. Cool for making subtle expressive shifts in the balance — but in our tests, the crossfading wasn't very smooth at low amplitude levels: The wave that was fading in jumped from inaudible to fairly loud in only two or three steps. When we used mod wheel data as a crossfade control source and programmed full modulation depth (+127), a mod wheel byte with a value of 1 or 2 did not cause the oscillator that was fading in to become audible at all. At a value of 3, it jumped forward into the mix, and at 4 it jumped forward quite a lot fur-

ther. You can get much smoother crossfading by using straight amplitude modulation, with both oscillators set to respond to the same modulation source, one of them in a negative direction. This doesn't produce an equal-power crossfade, unfortunately.

Innovative parameters that you don't often find on the competition include sample reverse (looped samples stay looped when reversed, which is a good thing) and sample start offset, for trimming a bit of the attack from a waveform. The sample start point can be modulated by velocity (or any other static modulation source), so you can bring in the attack transients under performance control.

And then there's the loop offset parameter, for that ever-popular Digital Native Dance effect. Like the Kurzweil K2000, Morpheus allows you to loop any segment of the sample ROM. If your chosen loop extends backward from the wave that you've selected into a previous wave — or back through a dozen different waves — you'll hear whatever sounds are stored in that memory region. Clank-buzz-chff-nnggg-bonk-scritchy! This parameter is terrific for nightmarish effect patches. It's a sort of poor man's version of wave sequencing, since you don't get to edit the order or the duration of the waves. Also unlike true wave sequencing, which transposes the samples correctly without changing the overall tempo of the loop, an off-set loop will change tempo depending on what key you play. You can turn keyboard tracking



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off for the oscillator that's creating the rhythm loop, which will lock in the tempo, but then the loop will always be at the same pitch. Well, okay, we said nightmarish, not groovalicious. Great fun, though.

The modulation routings in Morpheus are powerful stuff indeed. Each patch can have ten real-time routings and ten more note-on routings. The note-on routings are set up so that the value of the input at the time the note starts is used in a static manner throughout the note, while the real-time routings are used for types of modulation that change during the course of the note. The depth of the real-time modulation is programmable for each routing, and can be positive or negative, which makes this feature a distinct improvement on the Proteus.

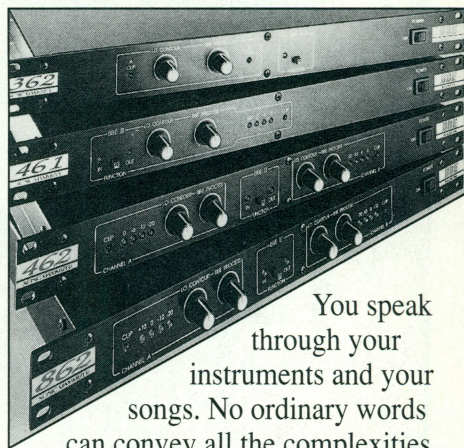
Each type of modulation has its own set of possible sources and destinations. For example, the note-on sources include key number and velocity (which obviously don't change during the course of a given note) but not the envelope generators (which do). Contrariwise, it would make no sense to use key number as a real-time source, since it is static throughout a given note. Instead, the real-time sources include items like LFOs, the auxiliary envelope, and mono and poly key pressure. The MIDI real-time controllers are also available as "note-on" sources; this allows you to do things like change the sound depending on the position that the mod wheel is in at the start of the sound, and then move the wheel without causing any fur-

ther effect on a note that is already sounding.

Quite a long list of destinations is available, from pitch and filter "morph" (that is, the momentary value of the offset parameter) to the attack, decay, or release time of individual envelope segments, pan position, portamento rate, and sample start time. The original Proteus "low-pass filters" (a parameter called "tone") are still available as note-on mod destinations. Since we always have a yearning for more esoteric functionality, we can't help wishing that loop offset was available as a destination for note-on modulation. For sources, a couple of multi-stage tracking generators would be nice. Instead, E-mu has given us (drum roll, please) . . .

. . . the function generators! Unlike the function generators on the Kurzweil K2000, which are algebraic processors for other signals, those on the Morpheus are flexible eight-stage rate/level envelope generators. Two are provided per patch, as modulation sources. To say that these envelopes can be looped would be a major understatement: For each stage, you can set a "conditional jump" to any other stage. Conditions include whether or not the note or a pedal is still being held, whether an LFO's or the mod wheel's current value is greater than a programmable threshold, or whether the note being played is above or below a split point. Thus you could set up a pitch envelope that was heard only below Middle C, or a vibrato (created by looping the first two stages) that disappeared when the key was lifted. Or something much

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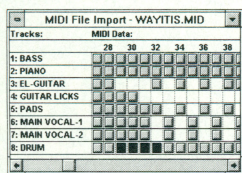
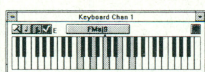
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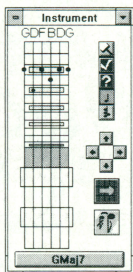
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## E-MU MORPHEUS

more complicated, if you dare.

And that's only the beginning. For each stage of the function generator, you can choose one of 63 different curves, including linear, exponential (seven different curves), groups of line segments, concave curves, zigzag patterns, immediate staircase jumps, and a heaping helping of partially randomized noise patterns. Sweeping the filters and pitch at the same time with the output of the function generators is a great way to turn a single note into a brilliantly shaped event. If this still isn't enough control for you, you can modulate the amount of signal coming from the function generator in real time — or use the second function generator to modulate the amount of the first one.

It's easy to figure out how the two relate to one another, because the time of each stage is programmed in milliseconds.

The big gap in the function generators' feature list is that you can't modulate their times, either as a group or the times of individual stages, from any other source. Unlike the envelope generators, for which the attack, decay, or release time can be modulated from (for example) key number or velocity, the function generators are going to run through their cycles and logical processes identically on each note. You can simulate a modulated envelope by programming the function generator to skip a stage or two if the velocity value falls below a given threshold, but this is a workaround, not true modulation. The absence of modulation inputs makes it more difficult to use the function gen-

erators as a more flexible multi-stage alternative to the normal Morpheus envelopes. They're best suited to special effects. Great effects, though. Multi-pitch trills, delayed LFO bursts, outer space twitters, you name it.

**Effects & Output Routings.** Morpheus has a built-in dual effects processor, which can create reverb, early reflections, flanging, phasing, chorusing, echo, and distortion. Frankly, the effects are the weakest part of the instrument. They sound okay, that's not the problem. The problem is that they aren't programmed as part of the patch. They're programmed at the Midimap — that is, the multichannel receive — level. As a result, when you send Morpheus a program change or select a new preset manually, *the effects don't change.*

*Continued on page 107*

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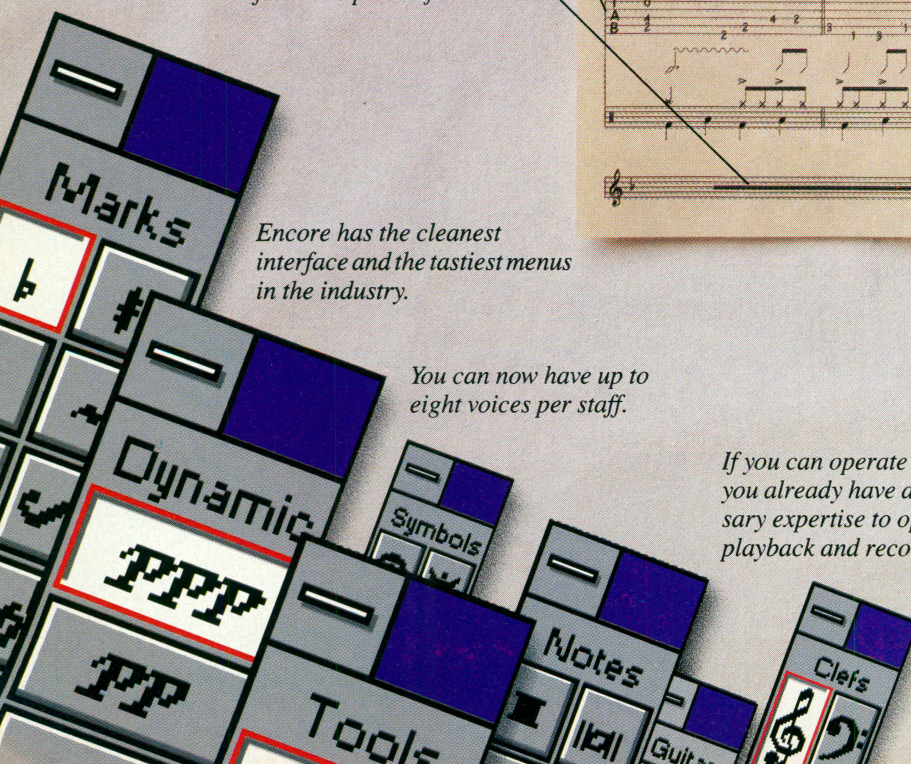
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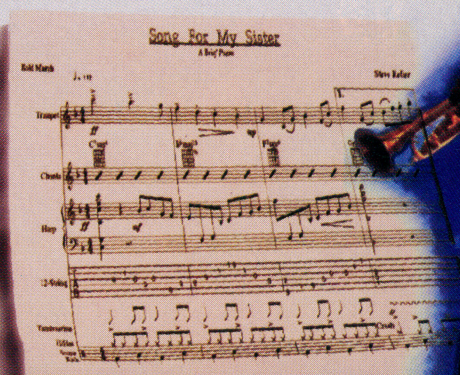




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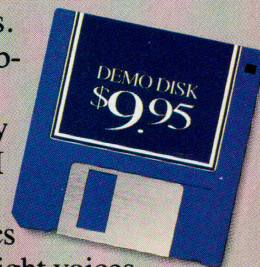
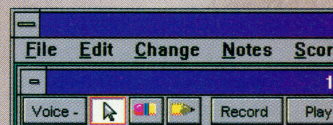
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## E-MU MORPHEUS

Continued from page 102

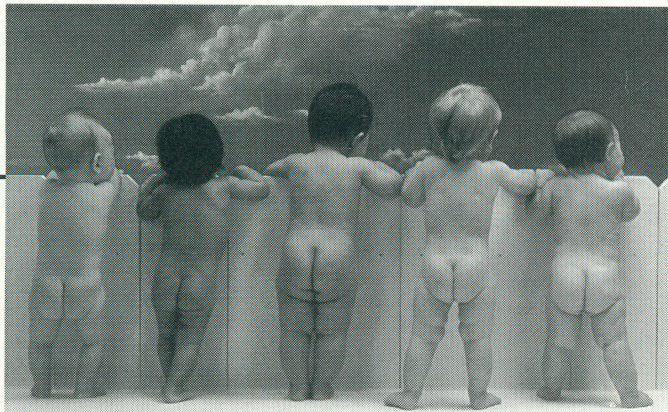
The manual explains how to switch among the 16 programmable Midimaps under MIDI control; to do this, you have to program your sequencer or controller with a short system-exclusive command string. This is not terribly difficult to do, but it's not exactly user-friendly either. Choosing a new effect as part of the response to a program change message has been standard on synthesizers since the M1. According to E-mu, many users of the Proteus MPS *were confused* by the fact that MPS effects, which were programmed as part of the patch, disappeared when the patch was assigned to a multi . . . although that's how effects are assigned on practically every other synthesizer on the planet. Morpheus was deliberately redesigned so that patches sound the same one at a time as they do in a multi. We'll be curious to see what kind of feedback E-mu gets on this new system. Admittedly, it's the same one used on the Roland Sound Canvas, but we're not sure they intend Morpheus to compete head to head with the Sound Canvas, so how applicable is the precedent?

One of the first things we did was bypass the effects entirely. Morpheus sounds are so darn detailed that we wanted to listen to them dry rather than lose the detail in a wash of reverb. After a while we spotted some patches that did benefit from specific effects, but it was such a

pain to program an effect manually each time we changed patches that we didn't often bother. It must be said that certain Morpheus filter configurations produce sounds (notably flanging and distortion) that have traditionally required an effects processor. In other words, you get a three-second head start coming out of the starting gate, but the horse has a rock in its shoe.

On the plus side, one of the effects algorithms is a true ring modulator. This intermodulates the left and right sides of the stereo field and produces only the sum and difference tones. By setting up the proper panning within the patch and then sweeping the pitch of an oscillator with a function generator, for example, you can get some terrific sideband effects.

There is a routing from the B effect back into the A effect, so dual effects can be programmed in series. The output of each effect can be sent to any of the three stereo pairs of output jacks. And for each MIDI channel you can select the main outputs, the first pair of sub outputs, or an effect input. At this point, the effects' wet/dry mix is used to get the dry signal into the output, so you can get the patch into the second pair of sub outputs by routing them through an effect. As in the Proteus, all four sub outputs are stereo tip/ring/sleeve jacks, and can function as effects send/returns for hookup with external effects boxes. Since external effects presumably will respond to MIDI program changes, this is a viable method for assigning effects to individual patches, at least for sequencing and



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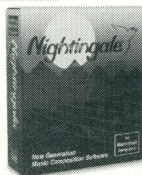


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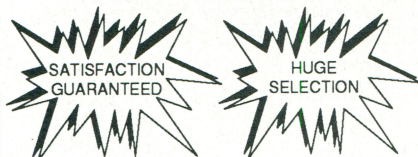
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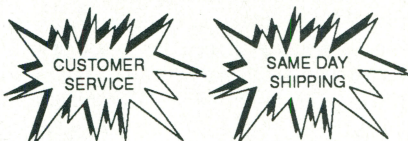
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## E-MU MORPHEUS

master keyboard applications.

The Morpheus reverbs sound very nice, as do the chorus and flange. The maximum delay time, on the other hand, is a pathetic 209ms for the A delay and 104ms for the B delay. For reverbs, you get to program the decay time. Period, that's it, the end. No early reflection level, no high damping, none of that fancy stuff. For other algorithms, several parameters are provided — feedback, modulation depth, and so on. No real-time MIDI control of the effects is possible. All in all, this area of the instrument is marginal, but at least the send/return jacks let you add better effects without using up one of the sends on your mixer.

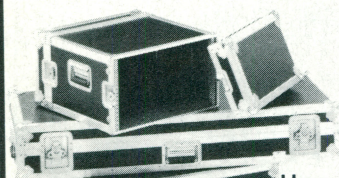
**Hyperpresets & Midimaps.** Morpheus allows presets to be split and layered in Hyperpresets. The internal memory holds a generous 128 Hyperpresets, each of which can use up to 16 individual presets. For each preset, you can program a key and velocity range, a velocity offset, panning and volume, transposition, and coarse and fine tuning. Velocity offset is a cool parameter that you don't see too often in a multi; it makes timbre blending in a layer much easier. Negative offsets will take the received velocity down to 1, not to 0, so you won't lose the layer by playing too soft.

Just for fun, we set up a three-patch layer in which two of the patches used the double/de-tune parameter. This meant that each note on the keyboard was triggering ten oscillators. When we played three-note chords, the attacks of the notes were spread out very audibly. We heard much the same effect when sending a 16-note chord to a single two-oscillator patch — a fast smear, not a unified attack. In the response time department, Morpheus is not exactly a snail, but it's not a screamer either.

Each Hyperpreset has an additional function generator, which can act as a modulation source for patches that are active within the Hyperpreset. The modulation routing must be programmed within each patch, using the Hyperpreset's function generator as a source. Basically, this setup is a way of getting synchronized vibrato into layered patches. The Hyperpreset function generator can't be retriggered by notes; it "free-runs" continuously from the moment the Hyperpreset is called up. The logical processes can simulate retriggering, however. And with a little clever programming, you can make the function generator do tricks that no LFO ever heard of, such as change the shape of its output when the sustain pedal is pressed. It won't modulate the ROM presets in the Hyperpreset, since they won't have the requisite modulation routing(s) programmed. Oh, well — nothing's perfect.

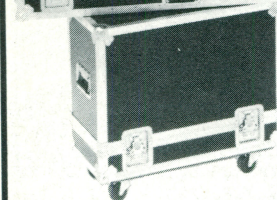
Sixteen Midimaps are available for multi-channel reception. Each channel, if switched on, can be assigned its own preset or Hyperpreset. Volume, panning, output select, and a variety of MIDI message receive enables are provided for each channel. For the audio output, you can choose main, sub 1, effect A, or effect B. The only way to get a channel's output to

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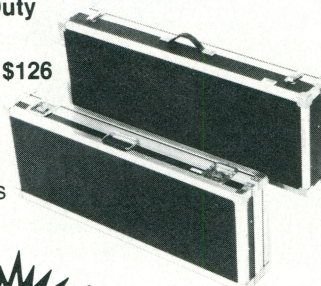
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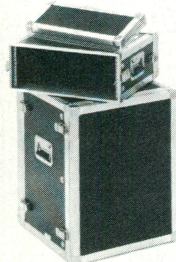
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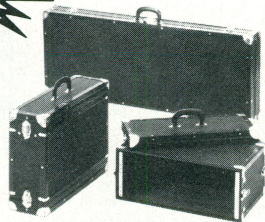


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"In three short weeks I've noticed a vast difference in my listening skills." T.E., guitar

"Someone played a D major chord and I recognized it straight away."

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"Although I was at first skeptical, I am now awed." R.H., sax

"A few days after starting the course the music did seem more colorful and vibrant." J.P., Australia

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## E-MU MORPHEUS

be transmitted to the sub 2 jacks is by routing it through one of the effects. At this point, you can set this effect to "no effect" if you want to hear the sub 2 signal dry.

In addition, you can select one of four MIDI program change remap tables for the Midimap. The four remap tables are programmed globally, and each Midimap uses one table across all 16 channels. This is potentially a very helpful feature if you do a lot of sequencing. It's too bad that it's not possible to assign a program change on a global channel to switch Midimaps. As mentioned earlier, Morpheus effects are programmed as part of the Midimap, and switching Midimaps requires that you program a short sys-ex string into your sequencer.

**Conclusions.** With Morpheus, E-mu has taken a bold leap into uncharted territory. Thanks to the advanced filters, it has a sound all its own, and the function generators are powerful and forward-looking as well. Because the sound is so unmistakably electronic, we're betting that Morpheus will be embraced first by techno artists. If what you want are ultra-realistic acoustic instrument emulations with maybe a little extra sizzle, Morpheus may not be the right instrument for you. When it comes to lead synths, multi-dimensional pads, whacko percussion, and real-time controller response, it's a champ.

The big disappointment in this box is the effects section. We're willing to put up with

stripped-down, entry-level effects, because Morpheus has so much else going for it — but the fact that you can't program the effects into individual patches is a major bummer. Our advice: Switch 'em off and listen to Morpheus dry. Its sonic character is so distinctive that you may actually like it better without effects — and we can't think of another synthesizer that we'd say that about.

A few mid-level synth programmers will probably feel that E-mu made the right decision in providing preset filter templates, but we're not convinced. Beginning programmers are going to be thoroughly confused by the box in any case, and advanced sound designers are bound to deplore the lack of access to the dozens of filter parameters that are lurking somewhere in the bowels of Morpheus. The programming layout is a compromise, and it's typical of compromises that nobody is really pleased with them.

It remains to be seen how Morpheus's multi-stage filtering will stack up against other emerging methods of tone generation. For the present, it's a lot more affordable than physical modelling. But subtractive synthesis, by its nature, can only work on overtones that are already present in the waveform. This is why Morpheus comes equipped with such a great set of single-cycle waves. It's a transitional technology, not a breakthrough, but its palette of sounds is rich enough that programmers will be able to spend years probing its limits.

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## OPCODE VISION 2.0

### SEQUENCING SOFTWARE (MAC)

By Michael Marans

**S**OME SOFTWARE MANUFACTURERS try to impress us by making every new feature update a whole new version number — a few years into the life of the program, and they're up to version 17.3. Others are more conservative, relegating bug fixes, feature enhancements, and so on to the "tenths" column of a version number. Moving to the next higher number in the "ones" column requires a major change — say, for example, a complete rewrite of the user interface, or a substantial overhaul of the program's basic functionality.

So it is that over the past several years we've seen Vision, Opcode's premier professional sequencing package for the Mac, live

its life in various 1.XX incarnations. Despite numerous fixes and enhancements — some as major as the ability to perform edits in real time — the program never made it beyond version 1.5. Until now. Vision 2.0 (actually, 2.01) has just been released. Given the fact that this is the first time in four years that Opcode has seen fit to increment the "ones" column, you've got to imagine that this is one serious upgrade. It most certainly is.

**What's New?** The first thing you notice about Vision 2.0 is that it has a brand new look. Gone is the jumbled, hard-to-read mishmash of screens and condensed typeface that char-

acterized earlier versions. The new Vision sports the ultra-fashionable gray windows and 3D buttons now found on most of the newer high-end Mac applications. Not everything is gray, however. In fact, Vision 2.0 is in glorious, living, programmable color.

Many of the program's windows have been completely redesigned, and new ones have been added to accommodate the new functions. The overall graphic redesign makes learning and using Vision an easier and much more pleasant experience than before.

Those of you who can relate musically to a bunch of dots and lines on a piece of paper will be glad to know that in 2.0 you can view and edit your MIDI data as music notation, as well as print it out. Yes, the print quality is good enough for generating lead sheets and parts for session players. No, the notation utilities won't — nor are they intended to — take the place of a full-fledged music publishing program.

Another new feature is groove quantizing, which allows you to lock your data to pre-determined rhythmic feels. The program comes with a number of grooves, including shuffle, triplet, laid back, and pushed feels — several of which are designed for use with specific instruments, such as snare or kick. You'll also find a slew of Akai MPC-60 feels — included because of a large number of user requests. One really hip thing: Many of the grooves also feature velocity templates — a "feel factor" that can be just as important as rhythmic values when it comes to nailing a groove. And if the pre-programmed feels aren't to your liking, not to worry: Your own grooves can be saved and loaded as desired. Naturally, all of the original grid quantizing utilities, such as sensitivity, strength, and smear, are still available. The update also includes global editing of multiple tracks from any edit window, the ability to have an unlimited number of sequences per file, and a Windows menu for quick access to all major windows. Version 2.0 sports a new timing architecture that reportedly uses less CPU time. Benefits include faster screen redraws and improved real-time editing response. And you can now sync to external sources when using MIDI Manager, and send sync information as MIDI time code.

Logistical problems prevented us from diving into another new feature, MIDI Machine Control. The program is shipped with a host of utilities for controlling MMC-compatible devices, such as the Alesis ADAT, from within Vision. Functions include full transport control, automated punch-in, programmable edit markers, and much more. We'll put the utilities to the test — as well as the JCooper DataMaster, which provides the hardware link between Vision and the ADAT — in an upcoming issue.

Many of the functions found in earlier versions of Vision remain the same, though getting



#### PROS & CONS

**Pros:** Intuitive, streamlined operation. Very flexible architecture. Powerful editing capabilities. Notation editing and printing. MIDI Machine Control.

**Cons:** Minor bugs and operational anomalies. Notation printing is very limited.

**Bottom Line:** A powerhouse sequencer gets a face-lift, and becomes not only more beautiful, but smarter and easier to use.

#### OPCODE VISION 2.0

**Description:** MIDI sequencing software.

**Hardware/Software Requirements:** Macintosh running System 7 (or higher) with minimum 4Mb RAM (Vision requires 2–2.5Mb) and hard disk. MIDI interface. Opcode OMS (Open Music System) system software version 1.2 or higher.

**Features:** Unlimited number of sequences/subsequences per song, with up to 99 multi-channel tracks per sequence. Nested sequences. Sequence cueing. Independent multiple meters and tempos per sequence. Scale time and relock utilities. Independent track looping. Track solo, mute, and scrub. Real-time, step, loop, overdub, replace, multi-channel, and automated punch-in/out record modes. MIDI data record filter. Piano roll, event list, track, and notation editing environments with non-contiguous event selection (both manual and via logical selection filter). Drag-and-drop editing for notes, tracks, and sequences. Graphic controller editing. Notation printing. Programmable faders with controller-remap functions. Flexible quantize utilities including non-destructive, quantize on input, and groove quantize. Automatic sequence generation. Controller chasing. User-programmable MIDI keyboard equivalents for Macintosh key combinations. Programmable metronome modes. Imports/exports Standard MIDI Files. SMPTE, MTC, and MIDI Machine Control support. On-line, context-sensitive help.

**Copy Protection:** Two hard disk "authorizations" included. Authorizations not harmed by hard disk optimization routines.

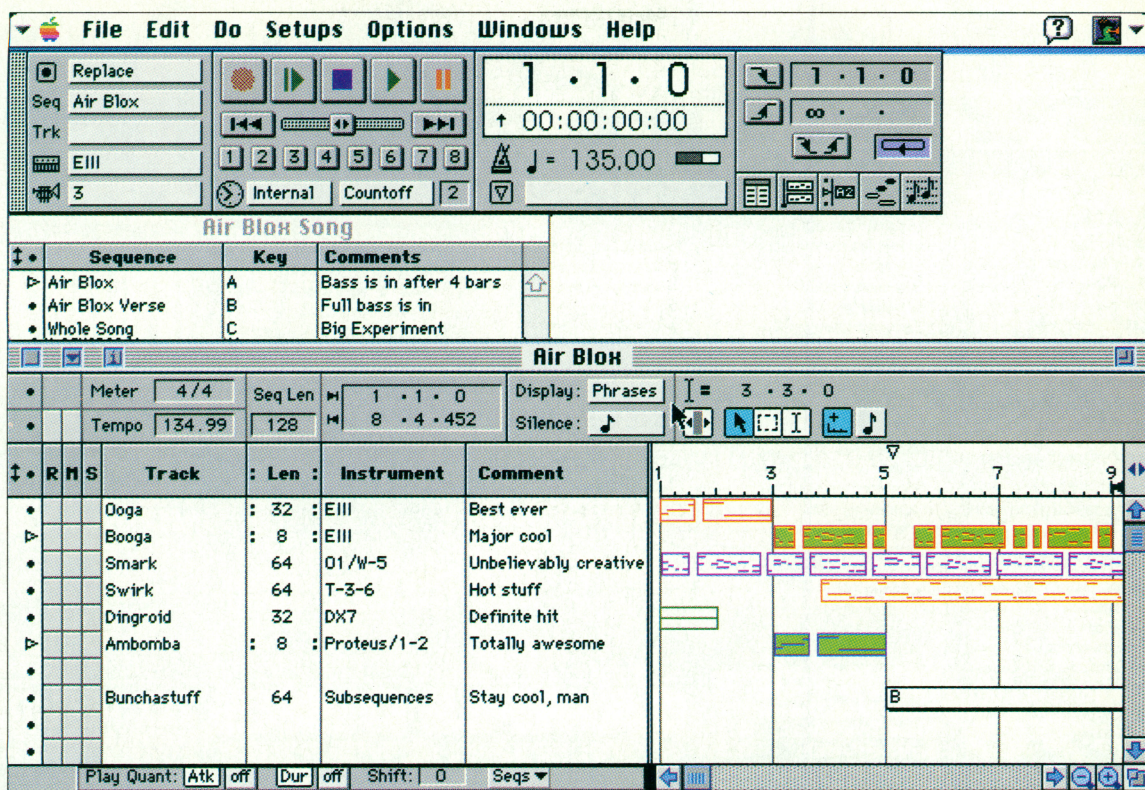
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Fig. 1. Vision's new look.

The Control Bar (top) gives you access to transport functions, record track assignments and patch selection, plus punch-in/out and loop pointers. The icons in the lower right are used to get to the edit windows quickly. The Tracks window (lower) shows basic track information, such as the track name and instrument, on the left, and MIDI data on the right. Phrase mode, used in this example, allows the note data to be shown in musical chunks, rather than divided into evenly spaced blocks — though that display option is also available. The solid block labeled "B" is a subsequence comprising multiple tracks. The green highlighting indicates that the data has been selected for editing. (See page 116.)



at them is much easier. Still, Vision is a complex, sophisticated MIDI sequencing environment; before we dive into the details of the new features, a review of the basics is in order.

**Background Check.** If you already own Vi-

sion and are interested primarily in how the new features of 2.0 work, feel free to skip this section. Those of you who want to dive in at the very beginning should check out our July '89 review of the original Vision (v. 1.02), the November

'90 Vision clinic, and the January '91 review of StudioVision.

Vision records MIDI data on *tracks*, which are organized into groups in *sequences*. Entire sequences can be entered as events in the tracks of other sequences, at which point they become *subsequences*. This sequence/subsequence architecture allows you to string multiple sequences together to make a complete song. For example, sequence 1 could be the intro, sequence 2 the verse, sequence 3 the chorus, and so on. Enter these individual sequences as ordered events in a track of sequence 4, and you have your song. Sections of tracks can also be defined as subsequences, allowing the creation of detailed and precise arrangements, including nested loop-style effects. Multiple sequences can be played simultaneously. Cutting and past-

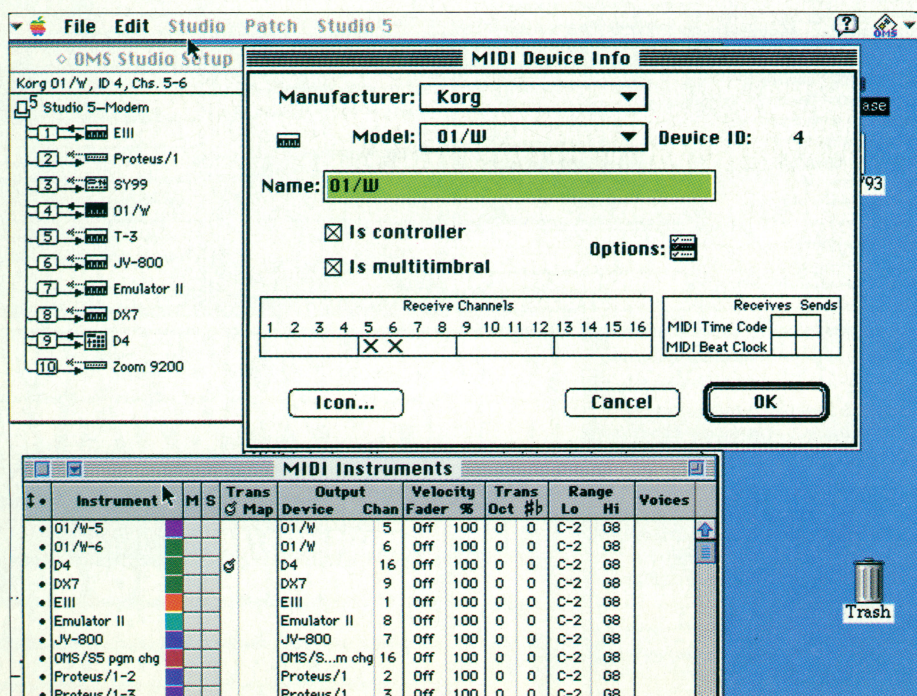


Fig. 2. Before you can start using Vision, you need to describe your studio setup — the MIDI routing, channel assignments, and so on — in an OMS document. The window at the upper left shows the configuration we used. The Opcode Studio 5 MIDI interface is connected to our computer's modem port; MIDI instruments and sound modules are connected to the various Studio 5 input and output ports. The upper-right window is where the parameters for individual instruments are configured. Once the configuration description is complete, Vision takes the information and creates the Instrument list (bottom window), which is then used for track assignments within sequences. (See page 115.)



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## OPCODE VISION 2.0

ing across sequences is supported; to do the same across files, you have to copy the sequence to the Mac clipboard, open the new file, then paste the sequence into the newly opened file. Alternately, you could export/import the file(s) in Standard MIDI File format.

Editing facilities are as powerful as you might expect in a pro-level package: full cut/copy/paste graphic and list editing, plus a variety of programmable utilities, including a logical selection filter and scale-based transposition. (The transpose function also allows the saving and loading of transposition maps, useful for remapping drum tracks from one machine to another.) All edits can be performed in real time without interrupting playback. Clock resolution is 480 ticks per quarter-note.

Navigating through the program is performed via the mouse and/or key commands. Virtually every function or operation has an associated key command. Control from a MIDI keyboard is also supported, and the key command set is fully programmable.

Assorted features include SMPTE/MTC synchronization, definable markers, extremely flexible loop recording, automated record punch-in/out, scrub playback, graphic entry/editing of controller data, support for multiple meters and time signatures, 32 programmable/editable faders with controller remapping and the ability to assign multiple faders to a single MIDI controller, context-sensitive on-line help, and much more. Vision also works hand-in-hand with Galaxy, Opcode's universal editor/librarian program. When the programs are used together,

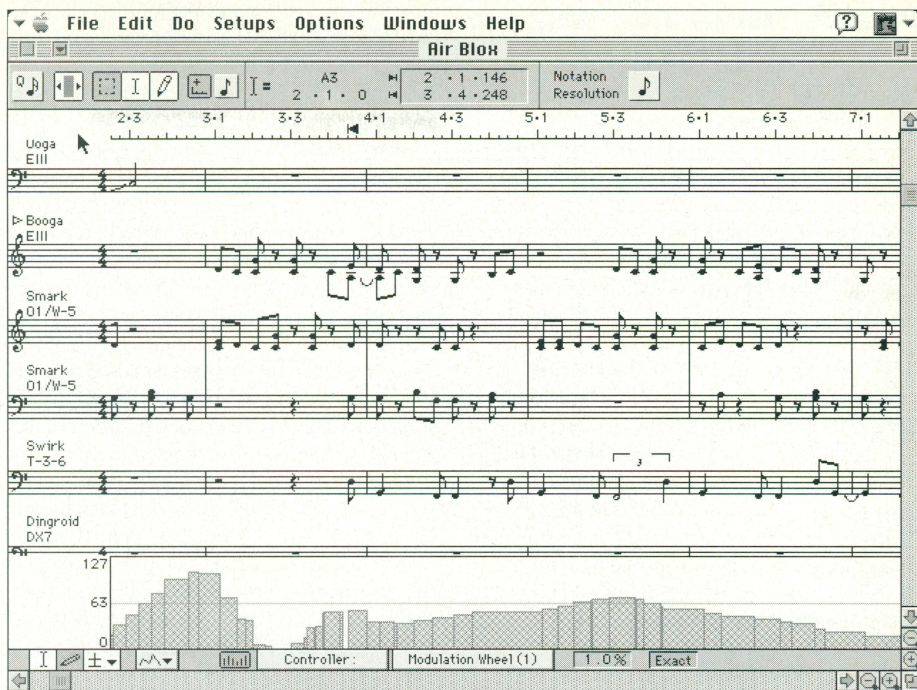


Fig. 3. The number of tracks that can be displayed simultaneously in the Notation window depends on the zoom magnification. In this illustration, we were able to get five staves and the strip chart (set for graphic editing of controller 1 data) and still keep everything readable on the screen — and when printed.

patches can be selected by name rather than simply by program change number.

While we're talking about other Opcode programs, we need to make an important point: Vision requires the use of Opcode's OMS (Open Music System), a system-level MIDI application.

In OMS, you create a document in which you detail the instruments in your setup, assign their MIDI channels, indicate which port of the MIDI interface they are connected to, designate them as controllers or receivers or both, and so on (see Figure 2, page 113). Vision then takes that information and from it creates an instrument list that is used for recording and playing back tracks. So rather than assigning your tracks according to MIDI channels and ports, you simply select the desired instrument by name. This is really a great way of working: Once you've gotten through the busy-work of describing your studio setup in OMS, the time-consuming and often frustrating aspect of working in a complex MIDI environment — that is, worrying about who's on what channel and what port and why aren't they responding (or why are they responding when they shouldn't be) — simply goes away.

(Actually, when we first booted Vision we couldn't get it to record our data because, as it turned out, our master controller hadn't been selected in the Enable Input Devices dialog. Our MIDI interface was enabled, and our controller,

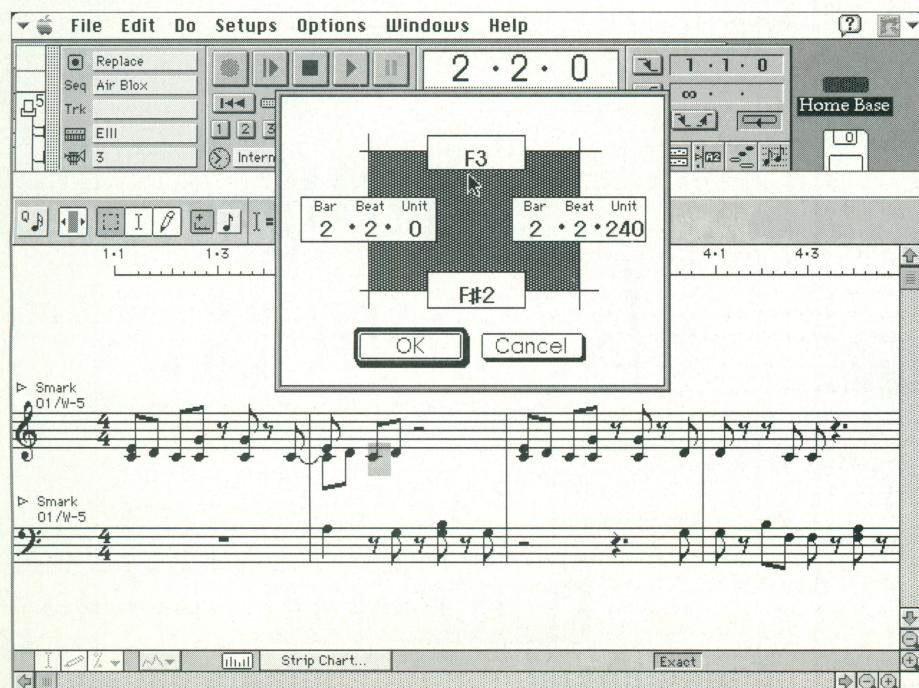


Fig. 4. The Notation window provides a pleasant alternative to piano-roll and list editing environments. Pitch, start time, and duration can be edited using standard drag-and-drop techniques. When "Exact" mode is enabled, as shown in this example, a pop-up dialog box appears when a note is selected for editing. This allows precise values to be entered from the keyboard. (See page 126.)



## OPCODE VISION 2.0

naturally, was plugged into the interface, but Vision insisted on seeing the direct connection. So much for automated set-up.)

Anyway, all the stuff we mentioned above — plus a couple of hundred other items, some of them seriously cool — serve to make Vision a powerful sequencing tool. What we haven't mentioned, however, is that in previous versions all that power was wrapped up in an interface that was . . . hmm, how to be delicate? Shall we say *intriguing*? Naw. Let's just call it what it really was: Obtuse and confusing. Oh yeah, and ugly. If there was ever a time for the cavalry to come to the rescue, this was it.

And indeed, the cavalry has saved the day. Vision 2.0 sports a streamlined, intuitive interface, a clean look, and simple, straight-ahead operation — without sacrificing power. In fact, the program is far more capable than before. Does this make Vision the be-all and end-all of Mac sequencers? Perhaps it's safest to say that version 2.0 helps the program hold onto its big-league position alongside MOTU's Performer, Steinberg's Cubase, and Emagic's Notator Logic.

StudioVision owners (or potential owners) take note: Opcode plans to integrate the 2.0 upgrade into StudioVision sometime in the first quarter of '94. (It may even be available by the

time this review reaches print.) According to the company, the two programs will look and function identically, with the obvious exception that StudioVision includes the ability to record and edit digital audio data.

Before we dive into the nitty-gritty of 2.0, we want to tell you about one of its features that has nothing whatever to do with its performance. Opcode, like many other companies, uses copy protection in their programs — something most musicians would rather not have to deal with. Vision has always been copy-protected; the master disk contained a limited number of "installs," one of which was used up each time the program was copied to a hard disk (a procedure that had to be done in order for the program to operate). The problem was, installs would be lost when a hard disk optimization routine was performed, so you had to de-install the program first — a definite pain. The new Vision contains not installs but "authorizations." The difference is, you can optimize your hard disk to your heart's content and you won't lose an authorization. This new scheme won't help you if your hard disk crashes, but it's a step in the right direction.

**The Control Bar.** This is one of the areas that has been significantly reworked for version 2.0. Fact is, no less than 19 pages have been devoted to it in the (completely rewritten) owner's manual.

The Control Bar (see Figure 1, page 113) is aptly named; it contains all of the transport controls, the track, sequence, instrument, and patch selection fields, the locate buttons and playback location indicator, the tempo selector/indicator, the markers pop-up, and the edit-in and -out pointers, which do double duty as record punch-in/out and loop-in-playback/record locations. You'll also find status indicators, such as the ones that display the sync mode and the number of bars counted-off before recording. Icons representing edit windows sit at the far right; click on an icon, and the window pops up.

Just as with all other Vision windows, the placement of the Control Bar is remembered when you quit the program. The default position is at the upper left of the screen, a choice that we saw no reason to override. Unlike other Vision windows, the control bar cannot be closed.

At the far left of the Control Bar is the record mode indicator. Four modes are offered, two of which are real-time and two of which are step-record modes. Replace is a real-time mode in which any existing track data will be erased. Overdub is a real-time mode in which existing track data will be retained. Step Replace and Step Overdub function identically to the first two modes, but they are not real-time operations. Rather, the user has control over the clock, which advances only when a new note (or

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notes, in the case of chords) is entered. When a step-record mode is selected, a pop-up window appears, in which note values, durations, and velocities are selected.

Immediately below the record mode indicator is the current sequence indicator; click on it and up pops a list of sequences to choose from. Unlike earlier versions of Vision, in which a maximum of 26 sequences per song was allowed, version 2.0 supports an unlimited (except by memory) number of sequences per file. Just so people familiar with Vision don't get too confused: The Sequences window in 2.0 was called the File window in previous versions. The former Sequences window is now the Tracks window, which we'll cover in detail below. (The Program and Note Names window was, according to the 2.0 documentation, renamed as the Names window, but in our copy of the program its name wasn't changed. Opcode tells they are aware of the discrepancy and are working on a fix.) Each sequence can have its own name (naturally) and be triggered for playback from any Macintosh key or MIDI event.

The next three fields, all of which have selection pop-ups, display the current track (for recording), the selected instrument, and the patch used by the instrument. Adjacent to each of these fields are icons and/or text that, when double-clicked, take you to an associated win-

dow. For example, double-clicking on the keyboard icon takes you to the Instrument window; double-click on the patch icon (a trumpet) and the Program window appears. If you double-click on the red shoes icon, you go home to Kansas.

The next group of functions are the transport controls. No surprises here — you can start, stop, rewind, fast-forward, etc. You're also given eight location marker buttons, which can be programmed on the fly. (User-defined markers can also be entered in real time, and their names appear in the markers field as their locations are reached.) The counter displays bars and beats or SMPTE time; toggling between the two is a simple matter of clicking in the lower of the two counter fields.

Below the counter is the tempo display — display being the appropriate word, as you usually don't edit the tempo in this field. For that, you would normally go to the tempo field in the Tracks window or to the current sequence's tempo track. You can only edit the control bar's tempo display if you mute the sequence's tempo track. Now why would you want to edit the main tempo display rather than the one in the Tracks window? Simple: You can't hear the changes made in the Tracks window tempo field until *after* they are made (*i.e.*, on mouse-up) — not exactly ideal when you're trying to determine the tempo where the tune grooves just

right. Alternately, you could record-enable the sequence's tempo track. When you do this, you can hear the tempo changes you're making in real time — changes that can be made with the mouse, faders, or directly from the keypad. (A variety of utilities for editing tempo maps are also provided). If you don't like what you did, however, you then have to re-record, or edit, or mute, or take some other extra step. None of this is really a big deal, but it seems like the whole operation could be a bit more streamlined. Guess that's the price you pay for having a system that allows each sequence to follow its own tempo map.

We did run into a minor bug in the Tracks window: We were unable to get the tempo track mute button to show its mute status — signified by an "M" — until after we changed the time signature from one value to another and then back to the original value. (Don't ask why that particular move was the key to making things work.)

While we're talking tempo: We couldn't get the tap-tempo function to work at all reliably. As long as we tapped at a tempo that was within a reasonable range of the current tempo, it seemed to work okay. But changes outside of the "normal" range — say, 10 to 20 bpm away from the current tempo — were not reflected properly. And once the tempo got very slow or very fast, new taps went completely

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## OPCODE VISION 2.0

unrecognized.

The next main portion of the control bar is dedicated to the numeric fields for the edit-in/out points, which, as mentioned earlier, also are used for punch-in/out and loop recording. The values for these fields can easily be set on the fly. The in and out points can't, however, be updated when a loop is playing, so you must stop and restart to move from one looped section to another when editing.

The last section of the control bar contains icons that represent the major editing windows; simply click on the appropriate icon, and the window appears. We found a small bug, in

which clicking on the Tracks window icon two times successively causes the icons to the right of the Tracks icon to gray out (horror of horrors!). Perhaps more significant: When you click on certain areas of the control bar the current active window — the Tracks window, for example — de-activates. This means you have to click on the window once to re-activate it, and a second time to perform the desired command (e.g., record-enable a track). Oddly, there are a number of areas on the control bar — notably the buttons and certain data fields — that when clicked do not cause the current window to de-activate. This element of surprise no doubt was intended to work to your creative advantage.

**The Tracks Window.** Operationally speak-

ing, the Tracks window is one of the more important complements of the 2.0 upgrade. As mentioned earlier, in previous incarnations of Vision this window was known as the Sequence window. But the new version adds so much functionality — it's a full-fledged edit window for track data — that the name has been changed. The fact that the window is where tracks are displayed and edited may have had something to do with the company's decision to change the name — dunno, we're just guessing.

The Tracks window belongs to the family of edit windows, which also includes the List, Graphic, and Notation windows (though these latter windows can't be activated until you've selected a track or tracks for editing). All of these windows share a common set of utilities, buttons, and displays. We'll detail them in our exploration of the Tracks window; your job is to remember that they're also available in the other windows. Naturally, each edit window also has a number of properties and functions not shared by other windows.

The first thing you notice about the redesigned windows is that the set of edit/utility/function icons is gone. (Rats. The swirling Mogrify icon used to be perfect for inducing hypnotic trances.) In their place is . . . nothing. Instead, what you have is a tiny triangle-shaped button located at the far left of the window's title bar. Press the button and *voilà*: A menu of window settings descends. The options in this menu are specific to the window, though some common items, such as Zoom To Fit and Jump To Selection, are found in multiple menus. Since the Tracks window is used to view and edit tracks, the edit menu includes items that relate primarily to the way track data is viewed.

Next to the settings triangle is another tiny button labeled with the letter "i" — the information button. Click on it and the window expands to show SMPTE information, including the offset and sync mode, and the sequence start (used to set the start time of the sequence, which can be any point in bar 0 or 1). This is a small change, in that this information was always displayed in previous versions. But its inclusion reflects the overall consideration of users' needs that went into this update: Why take up valuable screen real estate to display information that many users don't need to see? An optional toggle is the logical — and welcome — alternative.

Other window items — the meter, tempo, length, and edit point indicators, and the record, solo, and mute toggle buttons — have remained largely the same, though their graphics have been redesigned (see Figure 1). The track and instrument name columns are also included, but now there's a field for comments as well. You can't, alas, reorder these fields. But users are sure to appreciate that you can reorder the tracks within the window. Simply grab a track (the cursor becomes a "move" cursor when you

*Continued on page 123*

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**ProteusFX**





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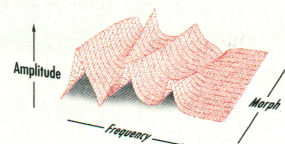
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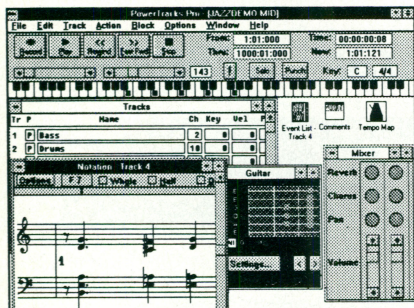
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## OPCODE VISION 2.0

Continued from page 118

click at the far left of a given track) and drag it to a new location. Groups of tracks — including those that are non-contiguous — can also be reordered freely.

As before, double-clicking on a track's selection dot opens that track's Graphic editing window. But you don't have to go to another window to edit your track data anymore, because a significant portion of the new Tracks window is devoted to the track overview screen, in which data can be displayed in a variety of ways and edited using the same commands offered in the other edit windows.

The track overview, which is located on the right-hand side of the Tracks window, is separated from the rest of the track information by a movable divider. You can drag the divider to allot as much or as little screen space to the overview as you need; double-clicking on the divider toggles between having the maximum and minimum space allotted. Several modes are available for determining how the information contained in the overview is displayed. One mode simply shades in the areas that contain data. This mode reportedly provides the fastest screen updates, though on our Centris 650 (a 68040-based machine) we detected no appreciable slowdown of screen redraws using the other modes.

Phrase mode — the one we found ourselves using most of the time — displays MIDI data in blocks that are separated by a user-programmable "silence" time during which there is no MIDI data. For example, if your data consisted of two bars of eighth-notes followed by a half-note rest followed by two more bars of eighth-notes, selecting a half-note as the "silence" value would result in a display that showed the two two-bar phrases encased in boxes that were separated by a half-note's worth of silence. On the other hand, if a whole-note had been selected as the "silence," the entire four-plus bars of music would appear as a single phrase in a single box, because the silence between the two phrases would be shorter than the defined length of the display silence. In phrase mode, the MIDI data is shown piano-roll-style inside the boxes, so you can get some semblance of the melodic and rhythmic nature of the displayed data.

Block mode is used to display the data in equal-sized blocks, ranging in size from a quarter-note to 16 bars. When you're doing large edits that fall on bar lines, such as when copying one verse to another, this mode is the logical choice. The final mode, simply called Tracks, displays all of the data in the track as a single block.

You can manipulate your track data — both raw music data and subsequences — quickly and easily in the track overview. Want to move a piece of data to a new track? Simply highlight the data by clicking on it, then drag it to the

new location. Want to move multiple, non-contiguous blocks of data? Shift-click to select them, and drag as desired. Want to duplicate a piece of data and place it on a new track? Option-click on the data and drag it where you will. This last operation can be very handy for having the same musical data played by two instruments, as it allows you to custom-tailor each track to the assigned instrument.

When you drag a subsequence or piece of data to a new track, the track's name and associated info is copied along with the data. But when you move the data out of the track — either by dragging it to another location or by deleting it — the track's name, instrument assignment, and so on remains. This is true even

though the track may be completely empty. On one hand, it's nice that the naming *et al.* is automatic. On the other, it can be very confusing to see track information displayed for tracks that contain no data. Opcode tells us that this mode of operation was implemented in response to users' requests; people wanted the ability to create track/instrument templates even when no data was present. We can see the benefit of this capability; we just wish there was a toggle so that the program could operate either way.

One weirdness: You can't use the Repeat Paste utility (in which multiple, successive copies of the selected data are pasted into a track) to paste data into an empty track. You must first



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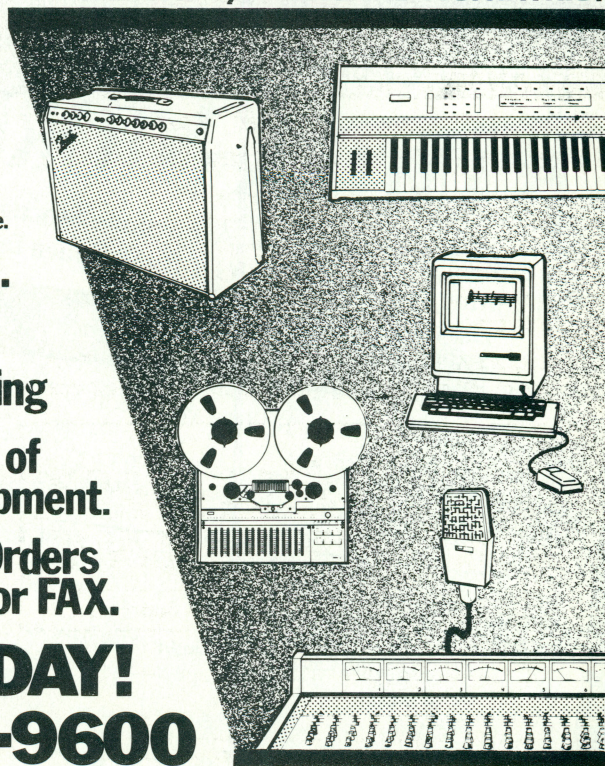
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## OPCODE VISION 2.0

paste a single copy of the selected data into the track. After that, the command works just fine. Opcode suspects a bug; as of press time, they were investigating.

Editing tracks in the overview screen is about as simple and intuitive as it gets. Editing routines follow many of the same conventions used in the other edit windows, so if you're used to working with Vision, you should feel right at home in this new environment. Data you wish to edit can be selected in a number of ways. To select the entire track for editing, you click on the track's selector dot. You can click and drag across blocks within a track; shift-click for non-contiguous blocks. An I-beam tool lets you select a time range across all tracks in the sequence. Alternately, you can use the marquee selector, a sizable box, to select a time range across specific blocks and groups of tracks.

We don't know if this is a feature or a bug, but it was definitely kind of cool: After you have selected an area with the marquee tool, you can shift-click-drag to resize the box — standard Mac operation. What's decidedly nonstandard is that you if you release the shift key and then press it again, you can draw new boxes without affecting the existing selections. We were able to use this technique to select multiple non-contiguous areas across several tracks. Spurred by success, we then tried the same technique

with the I-beam. This time the results were different: What appeared to be multiple selection was, in fact, the screen not being properly updated. Oh, well.

Selecting an item or items in one edit window automatically selects them in all other windows. This is really a boon, as you're likely to switch frequently from one editing environment to another according to the task at hand. Something else we appreciate: Closing the Tracks window closes all its associated open windows, such as the List, Graphic, and Notation windows. Conversely, all these windows are opened in their appropriate positions when the Tracks window is reopened.

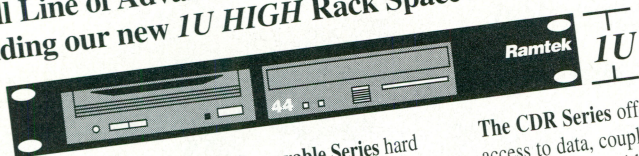
To help you zero in on the exact data you wish to edit, zoom magnification can be freely adjusted; a command allows you to switch between recently accessed levels. The selection cursor can be quantized for "snap-to-grid"-style editing, but with a twist: When you enable the cursor quantization, locations are referenced to the start time of the selected data. This way, if your phrases are unquantized, or quantized to points that fall in between "normal" time divisions, you can easily retain their timing relationships when moving them. For example, if you select a one-bar phrase that starts on bar 5, beat 1, tick 23, and move it one bar later in the sequence with cursor quantize enabled and set for a quarter-note, the data will be placed at bar 6, beat 1, tick 23. The cursor quantize

and zoom features are common to all of the edit windows except for the List window (in which, of course, they would be completely useless).

We did encounter some anomalies in the zoom operations. Each of the graphic edit windows has a zoom-to-fit icon, which, when clicked, causes the entire edit window to be filled with the selected data — most of the time. The windows also have plus and minus icons for both their vertical and horizontal scales (in the Tracks window, horizontal only); click on an icon, and the level of magnification moves in the appropriate direction — usually. And that's the problem: These functions don't always work as they're intended to. For example, in the Tracks window, option-clicking on the plus icon zooms the data to its maximum viewing magnification; in our experiment, about 240 ticks filled the available space. We then clicked on the minus icon, which zoomed out the view to a little over 480 ticks. A click on the plus icon zoomed us in to 375 ticks. Now an option-click to get back to our maximum magnification and . . . nothing happened. We had to first click on our minus icon and go back one level before the option-click command on the plus icon worked. In the Graphic window, option-clicking on the minus icon takes you to maximum zoom-in — just the opposite of what you would expect. In the Notation window, clicking on the zoom-to-fit icon resulted in a variety of weird behaviors, including one screen redraw

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bug in which the staff lines were split vertically and offset from each other.

One more gripe: When you enlarge the Tracks window (using standard Mac click-and-drag sizing) and then open the strip chart (the environment Vision uses for graphic entering and editing of data such as controller commands, pitch-bends, lyrics, program changes, and so on), everything is okay. But when you close the strip chart, the window returns to its original, smaller size. According to Opcode, this mode of operation was implemented in response to requests by users. The idea was to enlarge the overall window when the strip chart was opened so that none of the data seen in the original view would be obscured by the chart. That makes sense, but we'd still prefer it if the window wasn't made smaller when the strip chart is closed.

Yeah, we are complaining about fiddly stuff. But it is frustrating to see so many minor annoyances in an otherwise beautifully crafted piece of work. In our recent conversations with Opcode they've assured us that fixes and enhancements are in progress. In fact, version 2.02 was shipping as we went to press, and version 2.03 should be available by the time you read this.

**The Notation Window.** Opcode will be the first to tell you that Vision's notation utilities are not designed to replace or compete with dedicated notation programs. However, the Notation window provides a clear, easy-to-use edit-

ing environment for those who prefer to deal with "real" notes from time to time rather than piano-roll blobs or numeric data. In this window you can add notes, delete notes, and change their pitches, start times, and durations. Want to add an accidental? No can do. A slur mark? Nope. Drum notation? Unh-uh. Cross-staff beaming? Shirley, you jest.

When you open the Notation window, each track that has been selected in the Tracks window is displayed (see Figure 3, page 115). The key word here is *selected*. If, for example, you have only your bass track selected, a single staff will appear. (Depending on the note-range of the selected track, one or two staves will be used, with two being the maximum.) The more tracks you have selected, the more will appear on the screen. Depending on the number of selected tracks, you may have to scroll the window in order to view them all; just how many are visible at once is determined by the current level of zoom magnification and the size of your monitor. Each track's name and instrument is always displayed at the left hand side of the window, making it a simple matter to keep track of what you're viewing.

One very important point: If you attempt to display a subsequence as notation, you're going to be disappointed. Subsequences are displayed simply as a series of rests. In order to display the data within a subsequence as notation, you need to open ("unmake") the sub-

sequence in the Tracks window so that the subsequence's component tracks are displayed. These can then be selected for display in the Notation window. On one level, this is simply an extra step to go through (actually several steps, depending on the complexity of the subsequence data). On another, it has serious implications: If you have constructed a piece of music in which subsequences are utilized (a very likely prospect, considering Vision's architecture), you will not be able to display the music as notation and, consequently, will not be able to print it out. Fortunately, there is a workaround: Use either the Capture Sequence to Track or Capture Sequence to Sequence command to write the subsequence data as a continuous, linear file. Once that is done the linear data can be viewed and printed as notation.

When you display a track as notation, clef markings are based on the note-range of the selected data. You can set the key signature and designate the octave in which the notes are displayed. Both of these functions only determine the way the music shows up on the screen (or on the printed page); playback is unaffected. Notation resolution is another display-only function. Generally speaking, you set this parameter to equal the value of the smallest note or rest in your track(s). In essence, this performs a sort of "visual quantization." If, for example, you had a track with nothing but eighth-notes and the notation resolution was set to a sixteenth-

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## OPCODE VISION 2.0

note, your screen would likely be filled with a jumble of tied sixteenths interspersed with a slew of eighth- and sixteenth-note rests, due to variations in note-durations and start times. Set the notation resolution to eighth-notes, and the screen becomes eminently readable. In case you were wondering, the smallest note-value that can be represented is a 32nd-note triplet.

When it comes to screen legibility, the zoom utilities are invaluable assets. Passages of dense data can easily be magnified so that each event becomes clearly readable and, perhaps more important, readily selectable for editing. Speaking of which. . .

All of the editing facilities that are provided

in the other edit windows are available in the Notation window, as are the means for selecting the data you wish to edit (see Figure 4, page 115). We found no anomalies or weirdnesses, other than the zoom quirks mentioned earlier in the section on the Tracks window.

When it comes to printing the notation, the utilities are spartan, at best. You're given control over which tracks will print — you simply select them in the Tracks window. You can also specify the number of bars per line, the system spacing, staff spacing and indentation, and the space between the title text boxes and the staff. Size values can be entered in either inches or centimeters. You also get to select the font used for the title. And speaking of fonts, a bit-mapped version of the Sonata music font is included with the


program, and the overall print quality is quite good. We even got nice looking results with our Hewlett Packard DeskWriter C.

**Conclusions.** Since its introduction in 1989, Vision has held a well-deserved reputation as a powerhouse program. StudioVision, which added digital audio recording/editing to the MIDI sequencing environment, was a milestone in the technology of music — one that other companies have ardently striven to match. But match it they did. So Opcode found itself in the odd position of being an industry leader who suddenly had to play catch up with everyone else. After all, the other companies had the advantage of being able to learn from Opcode's (gulp) mistakes when they designed/redesigned their products.

The result of this is Vision 2.0, a superb example of the axiom that competition breeds excellence. In some ways, the update is a bit like a new bride — it's got something old, something new, something borrowed, and something blue (this last item being the laid-back snare groove in the new quantization templates — gads, what *Keyboard* editors won't go through to make an analogy work). Regardless, we're jazzed to see 2.0 arrive on the scene. It eliminates some of the major complaints users have had with Vision, and adds a number of new features that users can mull over for a while before they decide whether to call the company with congratulations — or new complaints.

In a nutshell, the new Vision is far easier to learn, far easier to understand, and far easier to look at than earlier versions. Of even more importance: The program is much more powerful than before, partly due to the addition of new functions, but primarily because the existing functions are now far more accessible and intuitive.

Yeah, there are minor bugs, anomalies, and the ever-present snurts and bliffles. We'd also love to see the notation utilities enhanced — especially with regard to the printed output. None of these things, however, are what we would consider fatal; you won't lose your data, and your creative flow likely won't be interrupted for too long.

Our final verdict? If we had three thumbs, they'd all be pointing up. 

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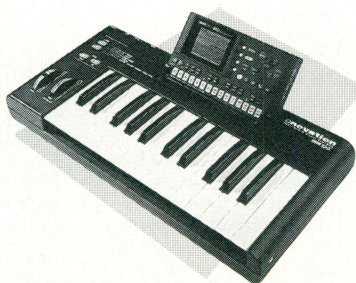
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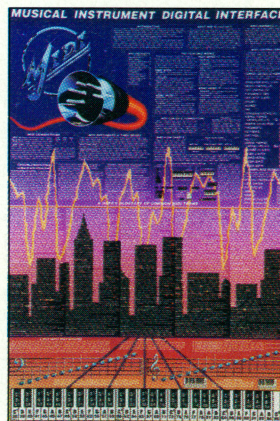


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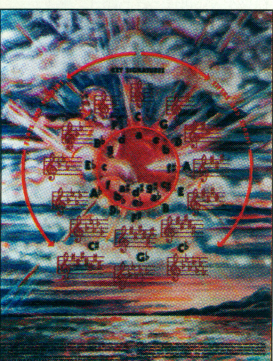
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## AKAI DR4d

### 4-TRACK HARD DISK RECORDER

By Mark Vail



**W**HEREVER HE'S MAKING MUSIC out there on the tundra, Brian sure could use one of these. Brian was an uprooted Alaskan guitarist/composer/multitrack recording whiz who lived in the San Francisco Bay Area for several years during the early '80s. At that time we worked together on a recording project. Over a six-month stretch, we concocted an impressive piece on his four-track tape machine — one piece of music, 14 minutes or so long, comprising splices from our free-form improvisations and lots of overdubs. The tape editing and mixdown jobs

were monstrous. By the time we agreed on the final mix of our masterpiece, Brian and I were ready to kill each other. If only we'd had something like the Akai DR4d!

Instead of recording eight tracks of digital audio on tape like the Alesis ADAT or Tascam DA-88, the DR4d records four tracks direct to one or more hard disks. (The "d" stands for Akai Digital as opposed to Akai Professional. Since there won't be a non-d version, from here on we're dispensing with the "d.") If you need more

than four tracks, you can sync up to four DR4s together for a 16-track system. Unlike most other hard disk recording systems, the DR4 doesn't require you to use a computer, so it's more convenient to take on the road or move from one room to the next than its computer-based competitors. At the same time, however, you don't have a CRT screen to display waveforms, a mouse to drag audio chunks to new locations, or a graphic interface to assist in seamlessly wedging two sections of music together.

Not to say that everything Brian and I used to do with two tape machines can be duplicated by the DR4. It can't do things like playing tracks in reverse and flying the results in during another part of the song — tasks that are easily performed on a computer.

In addition, unlike systems such as Digidesign's Session 8, which uses pointers that allow you to access and play different audio snippets simultaneously regardless of their location on the hard disk, the DR4 simulates a tape-based system in that it's linear. In other words, as far as the user is concerned, audio exists as a continuous stream of data on the hard disk. In order to repeat a section of music during a song, you have to copy the data to the appropriate location on the disk. Disk space is a precious commodity in hard disk recording, and the DR4's way of handling audio data may consume it much faster than a pointer-based system, depending on the type of material being recorded.

The DR4 isn't the first stand-alone hard disk recorder to hit the market. That distinction belongs to Wolfgang Palm's Hard Disk Unit, which came from the German manufacturer of the PPG Wave during the mid-'80s. Way ahead of its time, the 16-bit HDU was too expensive for the typical musician. Akai has managed to bring the DR4 in at a price that could make hard disk recording a viable alternative for more musicians. (See the table on page 131 for price comparisons.)

What does the DR4 offer for those of us working in a MIDI environment? It provides — as an option — an interface that transmits MIDI clocks and Song Position Pointer data for synchronizing a MIDI sequencer, allowing you to record any sound source with pristine 16-bit digital clarity for playback along with virtual tracks. However, the DR4 insists on being the master in this relationship. As you'll see, the master/slave relationship is not free of pain.

**One Real-World Application.** Upholding the personal custom that Brian and I started, I still gather friends for frequent improvs. A pair of DR4s arrived in time to record our latest session in glorious eight-track. Not only was I anxious to test them under fire, I also relished the opportunity to refute fellow editor Jim Aikin's recently stated Theory of Recording Jams. In his July '93 review of Digidesign Session 8, Jim

#### PROS & CONS

**Pros:** Excellent sound quality. Near-instant access to audio data anywhere on hard disk. Undo buffer for recording and edits.

**Cons:** Linear format doesn't allow efficient use of disk space. DAT backup is awkward and time-consuming.

**Bottom Line:** Easy as a tape deck to use, but few of the amenities of computer-based hard disk recorders.

#### AKAI DR4d

**Description:** Rack-mount four-track digital hard disk recorder.

**Media/Storage:** Up to seven SCSI hard drives. DAT backup of hard disk memory via AES/EBU or S/PDIF digital connectors. Backup to magneto-optical disk, removable media, or additional hard drives via optional IB111S SCSI-B interface.

**Features:** 16-bit linear PCM encoding. 18-bit 64-times oversampling A/D converters, 18-bit 8-times oversampling D/A converters. 32, 44.1, and 48kHz sampling rates with variable pitch playback (64 speed settings from 32 to 48kHz). Jog and shuttle wheels. Synchronization of up to four units for 16-track system. Eight edit functions (copy, copy and insert, move, move and insert, erase, delete, insert, and undo). Eight direct-locate points, 100 auxiliary locate points. Absolute and relative time modes with sync offset. Manual, footswitch, and automated punch-in/out; programmable preroll. Repeat play with no gap. Beat/tempo map for master MIDI clock control.

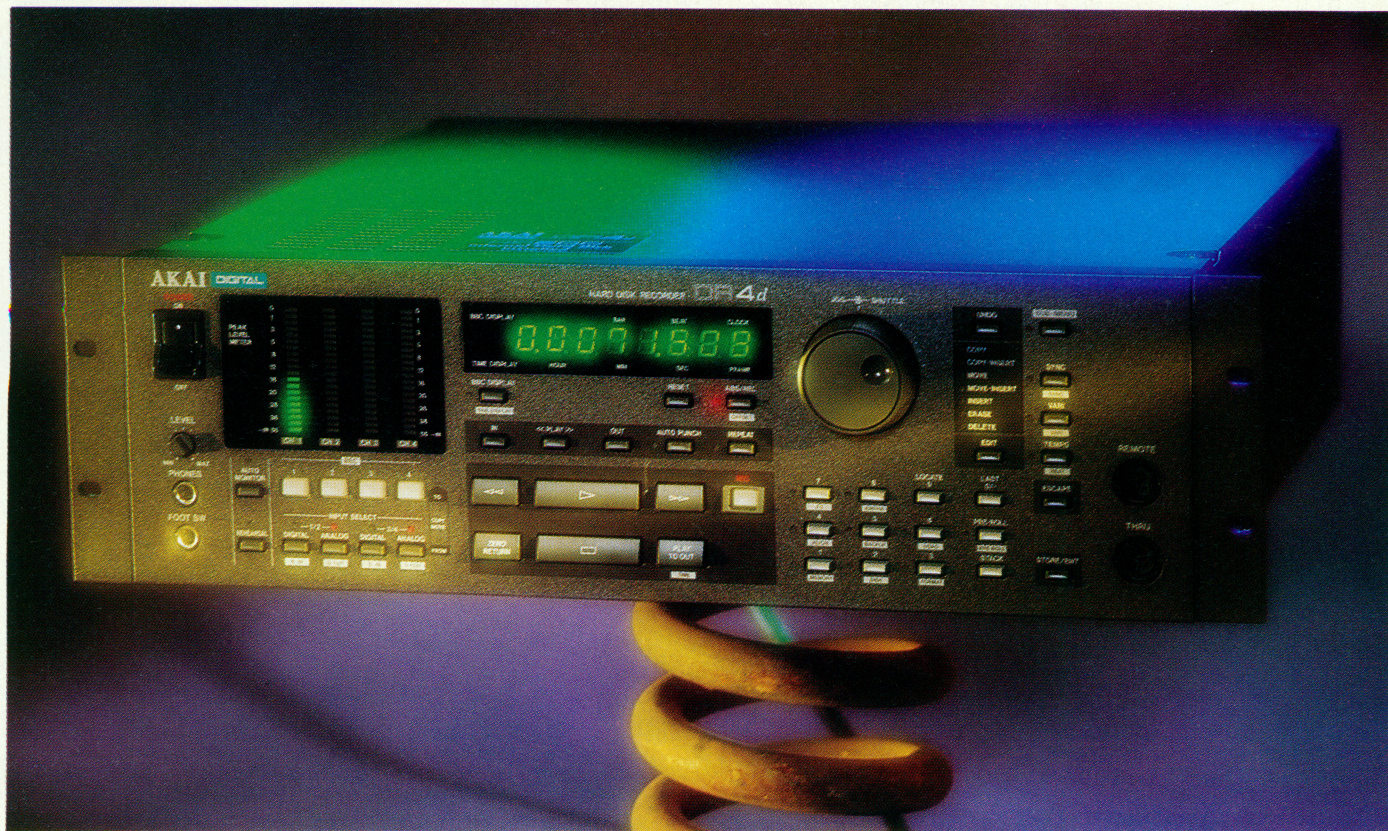
**Interfacing:** Rear panel: Four analog inputs, four analog outputs (all 1/4" tip-ring-sleeve, balanced or unbalanced; separate -10/+4dB switches for track 1 and 2 inputs, track 1 and 2 outputs, track 3 and 4 inputs, and track 3 and 4 outputs). XLR (AES/EBU) and RCA (S/PDIF) digital I/O connectors. 50-pin Amphenol SCSI port. Optional IB113M MIDI interface: MIDI in, out, thru. Optional IB112T SMPTE interface: 1/4" tip-ring-sleeve, balanced SMPTE in, thru. Front panel: 1/4" stereo headphone jack with level control, 1/4" footswitch jack (normally closed), multi-pin remote and thru connectors.

**Dimensions:** DR4d: 17" x 16-1/4" x 5-1/4" (three rack spaces; removable rack ears), 23.5 lbs. (with internal hard drive). DL4 remote: 15" x 6-3/4" x 2-1/4", 3-1/2 lbs.

**Suggested Retail Prices:** DR4d (without internal HD), \$1,995. DR4d-200 (with HD200 213Mb internal hard drive), \$2,495. DL4, \$849. 26" ALX50 cable (for connecting two DR4s), \$19.95. IB113M MIDI interface, \$159. IB112T SMPTE interface, \$199. IB110D digital I/O interface (for four channels of digital audio recording and playback), \$299. IB111S SCSI-B interface, \$199.

**Contact:** International Music Corp./Akai Digital, 1316 E. Lancaster, Ft. Worth, TX 76102. (817) 336-5114. Fax (817) 870-1271.





*What's so attractive about Akai's new DR4d digital multitrack hard disk recorder? It's self-contained — unless you want to chain extra hard drives together for additional audio storage beyond what the optional internal hard drive provides. You don't need to anchor the DR4 to a computer, and you don't need to stick tapes in it to record.*

speculated, "For uninhibited jams or live recording, an analog tape deck may be a better choice, because digital recorders of any kind are completely unforgiving. If the input gets a even little bit too loud, a digital system will record awful, grinding distortion." We managed to avoid excessive levels, and we were thoroughly gassed about the DR4's instant access to all the music that we'd recorded without waiting for tape to wind back and forth.

Actually, we only recorded six tracks at once, three on each machine, leaving one track per DR4 for editing and overdubs while extending the amount of available disk space. The instrumentation included two electric guitars, an eight-string electric bass, electronic drums, acoustic percussion, a harmonica, and synths. The resulting sound quality was superb, even though we had recorded at the slowest sampling rate (32kHz) in order to conserve hard disk space. Part of the credit for the great sound belongs to the magnificent 8-Bus console provided by Mackie Designs. (Everyone around here was drooling over the 8-Bus, dreaming about it living in their studios.) About a week before our jam session, when we first started playing with the DR4, we decided its built-in 200Mb hard drive wasn't going to provide enough recording time. Thankfully, the kind folks at Grey Matter Re-

sponse came to our rescue, graciously providing us with a pair of 1-gigabyte Mezzo 1/1 hard drives so that we could check the DR4's performance with external drives.

Recording time is potentially a concern not only for hard-disk recordists, but also for those relying on tape. Portastudio users typically have only 15 minutes of continuous recording time at their disposal. (Better four-tracks run at double-speed, and tapes that run longer than 30 minutes per side at normal speed are frowned upon for mastering applications, because they're so thin that they break easily.) In the past, we've been limited to that much time per tape in recording jam sessions. With the 1Gb hard drives, we recorded for an hour and 20 minutes and had disk space to spare.

To check out the DR4's editing functions, we spent a Saturday chopping up some of the jam tracks to produce several cuts that non-jam-participants could tolerate. Slicing and dicing audio on tape is a whole lot tougher than the way the DR4 handles such chores. Using your ears for reference, you pick the track(s), the section you want to edit, and in some cases a destination for the material; the DR4 takes over from there.

Recording our jam session on hard disk was a real treat. The DR4s performed flawlessly. We could listen to any part of what we'd recorded

and be ready to record new music in a flash. After the fact, we were able to re-order the sequence of our music and lose embarrassing mistakes before mixdown and without destroying the feel of the music. Granted, getting the best results took a considerable amount of patience because we were depending on our ears to splice parts together. Here's where a computer-based system would shine, showing a graphic representation of the music and allowing rearrangements of parts non-destructively thanks to the use of memory pointers.

**Hard Drivin', Man.** Hard disk recording requires lots and lots of one commodity: hard drive space. The more you have, the more you can record. Should you run out of disk space during recording, the DR4 will quietly stop, faithfully retaining what was recorded up to that point.

In digital audio, the faster your sampling frequency, the faster hard disk space is consumed. The DR4 offers three sampling frequencies: 32kHz, a digital FM radio standard; 44.1kHz, which matches CD, DCC, and MD rates; and 48kHz, the DAT standard. The faster the sampling frequency, the higher the audio bandwidth. The three choices provide 15, 20, and 22kHz of bandwidth, respectively. You should choose a sampling rate based on your audio requirements, intended application, and





To the upper left of the DR4's rear panel are 1/4" analog inputs and outputs; +4/-10dB level switches are provided for pairs of ins and outs. Digital I/O for two channels at a time is handled by XLR and RCA connectors. Installed to the lower left is the optional IB110D digital I/O interface, which allows four-channel digital audio recording and playback. Across to the right are the optional SMPTE and MIDI interfaces, and the SCSI-A port. Additional modules, such as the SCSI-B port for data backup, can be mounted in place of the blank panels.

## AKAI DR4d

available disk space. You can record different songs at different rates onto the same disk, but you have to set the playback rate to coincide with recorded material; the DR4 won't automatically adjust its playback frequency based on the recorded frequency.

While we're on the subject of playback rate, we also need to mention the DR4's great varipitch function, which actually increases the total number of playback and recording rates to 64, including the standards, 32, 44.1, and 48kHz. Varipitch is a parameter with 64 possible values; the range depends on the current sampling frequency. Playback can't be slower than 32kHz or faster than 48kHz. If you've recorded at 32k, you can increase playback speed by as much as 50%, but not slow it down. At 48k you can decrease playback speed by as much as -33.33%, but not speed it up. At 44.1k varipitch can range from -27.44% to +8.84%. To enable varipitch or change the sampling rate, you must stop the DR4, which could hinder attempts to tune the DR4 to an out-of-tune instrument.

How big a drive do you need? According to Akai, you can get almost 14 minutes of four-track music at a 32kHz sampling rate on a 213Mb drive (the size of Akai's optional HD200 internal hard disk). The same drive will hold about ten minutes of four-track material at 44.1kHz, and slightly over nine minutes at

48kHz. That should be enough disk space to work on a radio mix of a pop tune. You can expect four tracks to take up 15.4Mb of disk per minute at 32kHz, 21.2Mb at 44.1kHz, and 23.1Mb at 48kHz. Thankfully, like most other computer electronics, hard disk prices have and continue to come down all the time, allowing you to get more hard disk for your money. As the market stands now, a 1Gb drive costs about half as much as the DR4 itself, giving you almost an hour of four tracks at 44.1kHz.

Not just any hard drive will do. First of all, besides being a SCSI device, the drive needs to have a fast seek or access time. Akai recommends nothing slower than 19 milliseconds. Storage devices such as removable-cartridge hard disks and magneto-optical drives aren't recommended, because their seek times won't measure up — although Akai reports the new 105Mb Syquest removable drive is fast enough to use with the DR4. Second, the drive must provide a data transfer rate of at least 1.5Mb per second. You also need to be able to set the drive's SCSI device number. Finally, Akai recommends that it have two 50-pin Amphenol SCSI connectors, so that you can chain additional drives together for more recording time using the most common type of SCSI cable to connect the whole shebang together.

Each recorder in a multi-DR4 system requires its own hard drive; multiple DR4s can't access audio data on the same drive. Also, you

can stockpile up to 33Gb of hard drive space to work with the DR4, but you can't record more than 24 hours worth of material, because the DR4's counter tops out at 23 hours, 59 minutes, 59 seconds.

Hard drives add noise levels that can be disruptive in quiet studio situations. Actually, the DR4's internal HD200 is quieter than the Macintosh Centris 650 we're writing on, since the DR4 doesn't have a cooling fan. On the other hand, the Grey Matter Response drive sounds like a jet engine in comparison, thanks in good part to a rear-mounted cooling fan. Since the limitations of SCSI prevent you from using cables that are long enough to install your hard drives in a separate room, Akai's DL4 remote control could be an invaluable addition to your rig, allowing you to work the system from a comfortable distance. (See the DL4 review in the sidebar on page 133.)

For convenience, it might be best to purchase a drive that mounts inside the DR4. However, Akai recommends installing a drive no bigger than 500Mb to avoid thermal problems and possibly overworking the DR4's power supply. In any case, you should be able to find an internal drive that's less expensive than the optional 200Mb drive Akai can provide. Before you start shopping, contact IMC or your local Akai dealer for a list of DR4-compatible drives.

**Up in DR Front.** Over 40 buttons are arranged across the DR4's triple-space front pan-



el, but they're situated quite logically. Acclimating yourself to the unit shouldn't be difficult. Familiar tape-style controls such as fast forward, rewind, play, record, and stop are conveniently placed front and center. You won't find a pause button, because stopping playback does the same thing. Playback kicks in almost before you hit play, it's so fast. So is any locate function. You can jump from the middle of an hour-long recording back to the beginning, the end, or anywhere else *right now* and start playback immediately.

Above the transport controls is an LED display. Its eight green characters — half an inch tall and visible from across the room — normally display a counter in one of two formats. The first is time-based, in either absolute (as in zero is when recording started and everything is down the line from there) or relative (you can reset the counter wherever you'd like) terms. The specific format is hours:minutes:seconds:frames — the traditional SMPTE sequence — with two digits for each segment. You can specify which type of SMPTE protocol the display will follow: 24, 25, 30, 30 drop-frame, or 29.97 frames per second.

Alternatively, you could choose the display to read location as bar:beat:clock data, with four characters identifying the bar number and two each for beat and clock. How does the DR4 keep track of your rhythms? You have to create time signature and tempo maps. Whenever the beat and/or tempo changes, you enter a new time signature (with the numerator anything from 1 to 32 and the denominator at 4, 8, 16, or 32) or tempo (30.0 to 300.0 bpm) in the appropriate list. As long as the beat and tempo don't change throughout a song, you only have to enter this information at the start of the song. In either case, you must be playing to a sequencer metronome or drum machine.

Why create beat and tempo maps just to display the correct bar:beat:clock information? There's not much reason to. But you would have to in order to make use of the optional IB113M MIDI interface card, which allows the DR4 to run in sync with a sequencer. The DR4 insists on being the master source of clock and Song Position Pointer data; it won't sync to your MIDI sequencer. Thus, in order to fully integrate the DR4 into your MIDI environment, you'll need to work with its tempo and time signature functions, which almost certainly won't be as friendly as those of your sequencer.

While synchronizing our sequencer to some intricate tempo and beat maps that we had entered into the DR4, we discovered that the DR4 doesn't output MIDI clocks when you enable repeat play mode to rehearse a take. Therefore, the only way to maintain sync between the DR4 and your virtual tracks during repeat play is to record a rough mix of the latter into an open DR4 track.

There's another alternative: If you're working in a SMPTE environment, you can purchase the optional IB112T SMPTE/EBU timecode interface, which allows the DR4 to support contin-

## AKAI DR4d VS. OTHER DIGITAL RECORDING SYSTEMS

**H**ere's how the DR4d compares with some other digital recording systems, both tape- and hard-drive-based. The suggested list price in each case is for a basic system with no hard drives, but with a computer where necessary: a Macintosh IIci or better with a NuBus card slot for Audiomedias II/OSC Deck 2.1, and a 25MHz 486 IBM-PC for Session 8.

	AKAI DR4d	ALESIS ADAT	DIGIDESIGN AUDIOMEDIA II W/ OSC DECK 2.1	DIGIDESIGN SESSION 8	TASCAM DA-88
<b>Suggested List Price</b>	\$1,995	\$3,995	about \$3,700	about \$5,400	\$4,499
<b>Cut/Paste Editing</b>	yes	no	yes	yes	no
<b>Playlisting</b>	no	no	yes	yes	no
<b>Number of Simultaneous Record Tracks (Standard)</b>	4	8	2	8	8
<b>Built-In Mixing</b>	no	no	yes	yes	no
<b>DSP</b>	no	no	yes (non-real-time)	EQ, pan (real-time)	no

uous SMPTE resync in both record and playback modes. If there is any wow or flutter in your SMPTE source, as would likely be the case when using an analog tape deck as the master, the DR4 will track changes in speed by performing on-the-fly sample-rate conversions. Akai reports that the DR4 will stay in sync as long as the change in master clock rate doesn't exceed 5% in a one-second interval, which is a variation hundreds of times larger than you'd encounter when syncing to a real tape deck. In cases of extreme SMPTE fluctuation, playback of DR4 tracks will be interrupted until the machine resyncs; in record mode, the DR4 will simply stop. If you're recording into the DR4 while synced to SMPTE, any wow and flutter being generated by your tape deck will be faithfully recorded into the digital audio master. A better approach in this situation would be to record a rough mix of the analog material to one DR4 track and then lay down the digital audio overdubs while listening to the rough mix. We're told an upgrade of the DR4's operating system, due in March, will allow the DR4 to act as the master in a SMPTE system.

Decimal points in the display indicate which tracks contain recorded material at the current counter location, when the DR4 is accessing the hard drive, and when material on the hard drive is too fragmented. The DR4 checks available hard disk memory when you first boot it up and allocates space dynamically as you record and edit audio data. Disk frag-

mentation can occur on any hard disk recording system when you move material from one location to another, or overdub new material with previously recorded tracks. After you perform significant amounts of editing, the DR4's playback may stutter — the disk access indicator will probably be glowing incessantly. That means it's time to de-fragment your audio tracks using the data-alignment function. Then the hard drive won't have to work so hard to access sonic bits and pieces that are scattered across hard disk space.

When the DR4 isn't playing, you can jump to any time or bar:beat:clock location by entering up to eight numbers on the numeric keypad. There are eight programmable direct-locate buttons; two keystrokes is all it takes to program them, and they can be programmed without interrupting playback. In addition, there are 100 memory locations that you program with four keystrokes and access with three; these can also be entered during playback. The zero-return button gets you back to the beginning. (We can't help but wish there was an equivalent to automatically take you to the end of recorded material.) Activating the play-to-quit button causes the DR4 to jump back a programmable number of seconds and play through to the location you were at when you hit the button. This is a great way to check an edit you've just made. (More on editing below.)

For fine location, there's a jog (or "scrub") wheel with a finger indentation. The wheel allows



## AKAI DR4d

you to step through recordings by tiny increments (or decrements if you spin the wheel counterclockwise). Resolution is down to the sample, which is finer than the DR4's frame display. While moving the wheel you hear short bursts of sound, which you may or may not recognize depending on the recorded timbres and your familiarity with the content. The faster you turn, the faster the playback. If you spin the wheel fast enough, it's like manually spinning an album on a turntable. (You remember vinyl, don't you?) To cover more ground continually there's a shuttle wheel, which allows you to scan through a recording at speeds of one-quarter, one-half, double, or four times original speed. (Too bad it won't play at normal speed.) At one-quarter speed, the recorded material still sounds alien; it becomes recognizable at half speed. (If you're going backwards, the music will sound strange regardless of playback speed.) You might expect the multiple speeds to sound higher-pitched than at normal speed, but that isn't the case. Instead, you hear coherent slices of the material at normal speed — much like scanning a CD — which is eminently more useful than near-supersonic squeaks would be. You can engage the jog and shuttle functions during playback. Also, you can use the fast-forward and rewind buttons during playback to hurry through material.

If you're used to shuttling tape around with these kinds of controls, you'll be delighted by the DR4's instant response. There's no physical momentum to hinder changes in direction or speed of playback, and no fast-forward or rewind time to deal with. It's a joy to experience, especially when you engage the repeat function. This causes selected material to play over and over with *no* interruption between the end and beginning.

Four large LED columns indicate input and track levels. The lower halves of the 20-segment columns are dark green, and the rest are light green — except for the top segment, which lights red to indicate overload. Beneath each track column is a record-enable button. These glow in soft red during recording, or blink when the track is enabled for recording. We were disappointed to find during our jam session that you can't manually punch in on a track that hasn't been record-enabled before recording was begun. To punch in manually you have to "arm" the track's record-enable button before starting playback and then hit the record button. Or you can use a footswitch, but either way, the track has to be enabled first. We got caught in the jam recording just two people when others started joining in. To record the additional musicians, we would have had to stop and then restart recording. Thank goodness we didn't interrupt, because those two guys were burning.

Many of the DR4's front-panel buttons serve multiple purposes. Secondary operations are designated as sub-menu functions, and buttons are labeled for performing such tasks as refor-

mating a hard disk, executing a backup procedure, changing the type of digital I/O, or checking remaining disk space. The display communicates with you by showing text such as ALIGn, bUSY, and SuRE?? Choices are made and parameters changed using the jog and shuttle wheels. If you make a wrong menu selection, the escape button will get you out of trouble.

A submenu routine is provided so you can check on total and remaining hard disk space. You can also get readouts on leftover time depending on how many tracks you'll be recording. The track record buttons are used to indicate the number of tracks you intend to record. Unfortunately, when you're finished with this routine, escape doesn't disable the track buttons you had selected — a function that editing operations automatically perform — so you'll have to do that manually.

**Editing.** Other than its random access, the DR4 wouldn't be much different than a digital tape recorder if you couldn't manipulate the audio data in some way. Once you've got audio material in the DR4's hard drive, here are your options: You can copy a section from one or more tracks to another location on an equal number of tracks, which will overwrite material at the destination(s). There's also a copy and insert option, which shifts the material on the destination track(s) down the line past the copied and inserted material. Move takes a chunk out of one place on one or more tracks and puts it in another place, leaving a silent gap where it used to be. Move and insert works like copy and insert, except that the material is erased from its original location(s), leaving a silent gap there. Erase loses the selected material and leaves a gap in its place. Delete not only erases the selected track(s), but also closes up the gap where the selected material used to be. Finally, insert sticks blank space into a selected track or tracks. These edit functions can be performed on individual tracks or multiple tracks simultaneously. If you insert or delete material from a single track, that track's audio will be time-shifted in relation to the remaining tracks.

For the copy and copy/insert jobs, you get to specify a counter range and the source and destination tracks; you can only pick an equal number of each (*i.e.*, one for one or two for two). If you select three or four tracks, the copied material will go to the same track it started on. You can specify the number of times the copy will be replicated up to 99. The resulting copies will line up together on the same track, one after another. This will be especially helpful to those constructing entire songs out of passages that are, say, eight bars long. It's important to define the section to be copied so that it has rhythmically coherent boundaries. The move and move/insert commands work in much the same way.

If you're experienced with digital audio systems, you may be wondering about the DR4's crossfade operations when you butt two sections

together in an edit, or punch in or out of record mode. We're told the crossfade time runs from 2-1/2 to 3-1/2 milliseconds, depending on the sample rate. The DR4 uses an automatic zero-crossing finder to avoid clicks in transitions between digital audio chunks.

We haven't mentioned one of the most important edit functions: undo. After any edit operation that you perform, or any recording, you can audition both the original and new versions and keep one or the other. Of course, if you tax available hard disk space, you may be the recipient of one of the DR4's "ooPS" messages. In that case, you'll have to free up room somehow — such as by erasing tracks that have been recorded on but contain no significant audio — to perform the task.

On our DR4 editing wish list is an auto-erase function that would wipe from hard disk any audio whose level falls below a specified threshold for a specified period of time. We'd also appreciate the ability to merge two tracks down to one in the digital realm, without having to first convert them to analog and then back to digital. Then there are the neat DSP functions found on computer-based hard disk recorders, such as gain normalization to maximize a track's amplitude level, programmable fades, reverse playback, track merging, EQ, and time expansion/compression. We're told that graphic editing software for the Macintosh, which is under development, will allow you to perform most of these operations. If that sounds like a great idea to you, maybe you should be thinking about a computer-based hard disk recorder instead. Of course, with the DR4 it would still be easier to record a jam session without lugging along the computer. Akai also tells us version 3.0 of the DR4's operating system, which requires swapping a chip, is due to hit the streets in March. It will provide support for MIDI Machine Control, MTC output, and SMPTE generation via the optional IB112T interface.

**Dual DR4 Sync.** Unlike the master/slave relationships of the tape-based Tascam DA-88 and Alesis ADAT, DR4s work together in a rather unexpected way. When you push the sync button on the slave DR4, its counter doesn't jump to the same number shown on the master machine. When you start playback on the master, the slave plays from its current counter position. The counter doesn't jump to the same value as the master DR4 until you stop the master's playback or use a locate button. Likewise, if you fast-forward or rewind the master, the slave waits until you hit stop before it jumps to the same counter number as the master. While it's true the slave gets to the same place simultaneously as the master, one downside to this method is that, during fast-forward and rewind operations, you won't be able to refer to the slave DR4's signal-present indicators to detect where material has been recorded. Other than that, the two DR4s synced together beautifully. There's absolutely no delay in synchronized playback, which is an advantage compared to multiple



tape recorder systems.

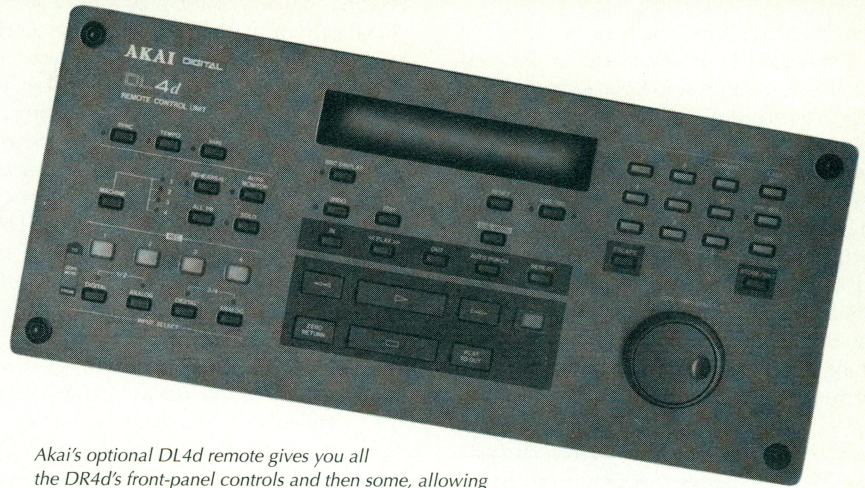
If we had our way, we'd make sure the front-panel sync and remote connectors were duplicated on the rear of the DR4, so that you could link DR4s in a rack without having an unsightly and obtrusive cable hanging over control panels and displays.

**Backing It Up.** So what are you supposed to do when your hard disks are full of audio tracks and you're ready to record something new? Trash the old stuff? No, not as long as you have a DAT machine with digital I/O ports. With our **Panasonic SV-3900**, we had the choice of using either the AES/EBU pro standard with XLR-terminated cables or the consumer S/PDIF format via RCA jacks to dump digital audio data for all or specific sections of hard disk memory to DAT tape for later recall. The process occurs at a rate of 48kHz in the digital domain, and you can hear the audio through the DR4's analog outputs or your DAT machine's audio outs. (If you sampled at 33 or 44.1kHz, the audio will be transposed to a higher pitch; 48kHz material will play at normal pitch.) The backup time takes half of the total amount of track minutes recorded. Thankfully, locate points and time-signature and tempo maps that you've defined are retained in the dump.

When you reload the data, you can control its destination on the hard disk by assigning a counter location. You can't overwrite material that exists on the disk. If you designate an area where audio has been recorded, you'll get an error message and have to select another destination where nothing has been recorded.

In spite of the fact that most hard disk recording systems allow you to back up audio tracks on DAT, we aren't thrilled by the concept. How appropriate that tape still finds its way into the recording process! The thing is, the DR4 spoils you with random access to audio data on hard disk. You get immediate feedback when you jump to different counter numbers and very fast responses to edits that you perform. In contrast, the backup process seems Neanderthal: You'll be transferring your music to tape (albeit DAT) with no immediate confirmation of the data transfer other than the DR4's display of "success" — which simply means that it transmitted the chosen data via the digital output. Although you could reload the dump into available disk space, other than by listening there's no way to verify the dump's accuracy. Also potentially hazardous: Your hard disk's backup time shouldn't run longer than the DAT tape. If it does, you won't be able to recover all your music — only that recorded on the DAT. To avoid this potential problem, you'll have to break the material to be backed up into separate chunks — by specifying sections of recorded audio in terms of counter locations — so that multiple tapes can hold the entire dump. You can't back up individual tracks (unless you move them to a section of hard disk where no other tracks exist), only all of the hard disk or specific sections; all of the tracks that contain audio within the section will automatically be

## DL4d REMOTE CONTROL



*Akai's optional DL4d remote gives you all the DR4d's front-panel controls and then some, allowing you to distance yourself from the irritating whirl of its hard drives.*

**I**f you want to get away from the DR4d and the din of its hard drive(s), or you'd rather sit back with a remote control in your lap than reach for the DR4's front panel in a rack, you'll want the DL4d. Its 30' cable allows you to distance yourself from your DR4s while controlling all of their functions. A footswitch jack is also provided for manual punch-in/out control.

Although the words hours, minutes, seconds, and frames (or bar, beat, and clock) don't appear on its single-line, 16-character backlit LCD (contrast knob included), counter locations are somewhat easier to read on the DL4 than on the DR4 because colons appear between the different segments of numbers. However, you'll need to refer to the DR4's display to read its signal-present indicators for each track, and also the disk-access indicators.

All of the DR4's front-panel buttons are present on the DL4, plus a few extras. One problem, though, is that the DR4's submenu functions aren't stenciled on the DL4's buttons. You may find yourself referring to the DR4's front panel just to verify which button to use in a certain situation. So much for convenience.

Not displayed on the DL4's front panel are the track and recording levels. You'll have to refer to the DR4's LED stacks for that information as well.

Whereas the DR4 uses LEDs next to the names of edit functions stenciled on its front panel, the DL4 displays the edit functions one at a time in its LCD. A machine-select button and four LEDs indicate which DR4 you're currently addressing. The DL4 can detect the number of DR4s that are connected; if there are only two, you won't have to cycle through machines 3 and 4 unnecessarily. Tracks on any machine can be enabled for recording and editing from the DL4.

When you enable tracks on multiple DR4s for editing, the DL4 will automatically perform edits on every track. We were caught off guard while deleting a section of audio from all recorded tracks on our two DR4s because we assumed we'd have to perform the same operation to both machines. Since we had enabled the appropriate tracks on them, the DL4 deleted the material first on one DR4 and then the other. It performed the edit while we were intent on manually executing the delete on the second machine from the DL4. By the time we'd finished, we realized the DL4 had already taken care of both machines. Unfortunately, we had deleted more of the music than we wanted in the original edit, but couldn't retrieve all the data because undo fixes only the last edit. Chalk it up to user error, not any fault of the DL4.

—MV



## AKAI DR4d

included as part of the backup.

Thank goodness there's an alternative to DAT backup: You can dump your precious DR4 recordings to magneto-optical disk, removable-media drives, or another hard drive system via the optional IB111S SCSI-B interface. Although we didn't have this \$199 option, it should be way faster than backing up to DAT. Another advantage to SCSI-B backup is that the transfer will be between machines that communicate with each other — the link is two-way rather than one-way — so verification will take place during the exchange of data. Other than those differences, SCSI and DAT backup are similar

in that you can't dump individual tracks and you can't name backup files.

Whether you use DAT or SCSI, you'll need to archive recordings for each DR4 in your system separately. Backing up our six tracks of improvised treasures required cable reconfigurations with the DAT machine to store all the data. Restoring the data promises to be just as fun.

The bottom line is, not only do you need to buy big, fast hard drives to go with your DR4, you also need at least one professional DAT machine or the optional SCSI-B interface and a Syquest or magneto-optical drive. Remember to add these costs to your DR4 budget.

**Conclusions.** Comparisons of the DR4 with the Alesis ADAT and Tascam DA-88 are in-

evitable. Let's construct a pair of digital tape systems that compare to eight track's worth of DR4 with internal HD200 hard drives, the DL4 remote, digital I/O, and the MIDI and SCSI interfaces. Along with the ADAT (\$3,995, reviewed Nov. '92), you would need the BRC (\$1,995), which provides SMPTE sync, and the AI-1 AES/EBU, S/PDIF interface (\$895). That's \$6,885 total. For the DA-88 (\$4,499, reviewed Oct. '93), there's the RC-88 remote (\$1,499), the SY-88 SMPTE sync board (\$799), and the IF-88AE AES/EBU and S/PDIF interface (\$1,099). Price of the Tascam system tops out at \$7,896.

Two DR4d-200s will cost you \$4,990. Add the remote, interfaces (for one machine only), connecting cable, and digital I/O (one for each machine) and you're almost up to \$6,815. In the end, a comparable DR4 system will cost slightly less than the Alesis and a lot less than the Tascam. Of course, reasonably sized hard drives for equivalent recording times on the DR4 will tilt the scales in favor of the tape recorders.

Another obvious competitor to the DR4 is Digidesign's Session 8 for the IBM-PC (reviewed in July '93). Although Session 8 carries a list price of \$3,995, you could expect to pay about \$5,500 for an eight-track system, including the computer. Session 8's audio interface also functions as a mixer, and it incorporates a playlist arrangement that allows random access to different portions of audio on hard disk during playback, so that you can repeat a section of music without having to copy the actual data. Thus, Session 8 is more memory-efficient than the DR4. It also provides DSP functions such as programmable crossfades and EQ, as well as graphic editing of playlists. In a fixed studio environment, Session 8 could make more sense than the DR4 if you need the additional firepower. But since Session 8 requires the computer, it won't be as transportable and road-ready. See the table on page 131 for a direct comparison of the DR4 with other digital recording alternatives.

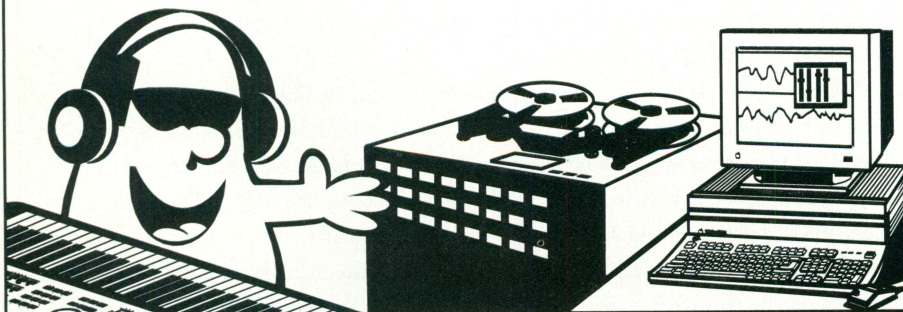
No doubt about it, the DR4 is a solid performer. Its linear playback scheme isn't disk-efficient and it could use more editing flexibility, but it's on the right track. It's basically an audio recorder that can immediately play back anything you've recorded and will perform some important editing functions that would be difficult or impossible on tape. People who are nervous about working with computer-based recording systems will appreciate the fact that there are no mazes of desktop icons to traverse or obscure DOS commands to memorize. Some musicians don't need or want the multiple functionality of a personal computer; they just want to record music and be able to manipulate the results. For them, the DR4 could be just the ticket. ■

*Special thanks to Grey Matter Response for loaning two Mezzo 1/1 1Gb hard drives and Mackie Designs for the loan of a 24x8x2 8-Bus mixing console.*

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## MUSITEK MIDISCAN

SHEET MUSIC RECOGNITION  
SOFTWARE (IBM-PC)

By Jim Aikin

**I**T'S A DREAM MANY OF US HAVE harbored in our hearts: Wouldn't it be great if you could get a computer to read sheet music and convert it into Standard MIDI Files? Think of the advantage for a film soundtrack producer working on a tight deadline and with a limited budget: The composer rushes pages of score to you, and instead of laboriously playing each line into the sequencer, you lay the page face-down on a scanner. All it takes are a few simple mouse clicks, a soft whir as the scanner turns the page into a bit-mapped file, and the dulcet notes wend their pristine way down the MIDI cable to your synth rack.

Or maybe you're a hobbyist, with a powerful PC rig hooked to a synth or two that you play for fun after work. You'd like to hear some of those great songs in *97 Popular Hits of the Seventies*, only your music reading skills are shaky. Shouldn't there be some kind of software that can translate printed music directly into MIDI?

Until recently, these scenarios were strictly in the realm of fantasy. For several years, optical character recognition (OCR) software has been available to turn the printed word into ASCII files that are readable by any word processor. Music recognition is a bigger challenge, however, for a number of reasons. The good news is, scanning software that can turn printed sheet music into MIDI files is now a reality. The bad news is, for the professional user we described above — or even an amateur who can read music and play a little keyboard — this software is slower than recording the music into a sequencer yourself. In its present incarnation, Musitek's Midiscan will be of interest mainly to hobbyists who can't read music at all, or who can read a little but can't play.



We don't like to rain on anybody's parade. Once you understand a little about the technical challenges, it's easy to see that Midiscan is doing an amazing job of translating blobs of black ink into objects that the computer understands are sixteenth-notes, quarter-rests, or whatever. We reviewed version 1.0, and within a year or two Midiscan may evolve into a much more powerful program. The current version, unfortunately, has little to offer the trained musician. The pro will find that sequencing a score one staff at a time is much faster than scanning it into Midiscan, correcting the inevitable mistakes, and then importing the results into a sequencer. (Also, Midiscan doesn't read handwritten manuscript, which pretty much sinks the fantasy scenario we indulged in above.)

For the amateur who normally records sheet music into a sequencer with step entry, Midiscan may be a viable alternative, but it's not magic. It's as tedious to use as a step-entry environment, because its raw output will be so riddled with errors as to be unlistenable until the file is hand-corrected, one note at a time, in the program's editing screen. If you can't read music at all, you'll still be able to correct the file by matching graphic objects on the screen — a definite plus for some hobbyists.

**Through a Scanner, Darkly.** In order to use Midiscan, you'll need some sort of scanner. While Musitek's ads (and the cover of the owner's manual) show a hand-held scanner, for best results the company recommends a full-page scanner, either flatbed or edge feed. A hand-held scanner should work for piano or piano-with-vocal music — anything where you can scan horizontally because the system of staves

is narrower than the width of the scanner. For our tests we used a Hewlett Packard Scanjet Plus full-page flatbed scanner with Deskscan II software. Midiscan itself does not include scanning software; that, presumably, will come bundled with your scanner.

Midiscan wants to see a black-and-white TIFF (Tag Image File Format) graphics file at 300 dpi (dots per inch), preferably no larger than 8-1/2" x 11". According to the Midiscan manual, Macintosh TIFF files are not truly standardized, so using a Mac scanning system and then importing the file to the PC may not be a reliable procedure.

It's important to give Midiscan clean, high-contrast graphics. Handwritten manuscript, no matter how carefully drawn, will not be readable. Musitek is adamant about not claiming manuscript scanning ability, but just for fun we thought we'd try it anyway. We prepared a two-bar piano passage using careful handwriting, with big round noteheads and stems that touched the beams and noteheads — in other words, not a typical composer's manuscript. Midiscan found the clefs and the bar lines, but was unable to identify a single note accurately.

Retreating to printed material, we had reasonable success with standard-size sheet music, but when we scanned an orchestral score that had been published with slightly smaller staves in order to fit into an 8-1/2" x 11" book, Midiscan's version was almost complete gibberish. If you've got something like a pocket score, you can use an enlarging photocopier to bring it up to size before scanning it. Most scanner software will enlarge an image, so you might expect to be able to skip the session at the Xerox machine, but the effectiveness of the scanner's enlargement is limited by its dot resolution. Pocket scores are often smudgy to begin with, and parts with ledger lines can be close to overlapping the next staff; add some excess pixelization caused by a limited scanner resolution, and you've got a recipe for hashed potatoes.

Speaking of odd score sizes and shapes, Midiscan can rotate "landscape-oriented" scores by 90 degrees, so things like organ sheet music are not a problem. This could also be a better way to get an orchestral score into the system at a bigger enlargement: Break it up horizontally into two separate "scores," and then reassemble the resulting MIDI files in your sequencer.

**The Conversion Process.** Once you've got a series of TIFF page files on your hard drive, Midiscan can start to work its magic. Multi-page scores aren't a problem. Midiscan will flow the music together into one continuous file. At this stage, there's not a lot of user involvement: You locate the files, click on OK, and the program does its stuff.

First it locates the staves. The TIFF file is shown on the screen during this process, and the left and right end of each staff will be briefly marked out with an inverse-video rectangle. As long as you've been careful to scan the score with the staves close to horizontal, Midiscan

### MUSITEK MIDISCAN

**Description:** Optical music recognition software.

**System Requirements:** IBM-PC or compatible, 386 or higher, VGA or better monitor, Windows 3.1, 300 dpi scanner and associated software. MIDI sequencer and tone module or compatible sound card.

**Features:** Accepts black-and-white TIFF files of scanned sheet music, produces MIDI files readable by any sequencer. Translates up to 16 staves per system. Automatic 90-degree rotation of "landscape" sheet music. Recognizes notes, ties, beams, bar lines, key and time signatures, and accidentals. Any object can be added or deleted in MNOD editing environment. Simple TIFF editor for cleaning up scanned images prior to processing.

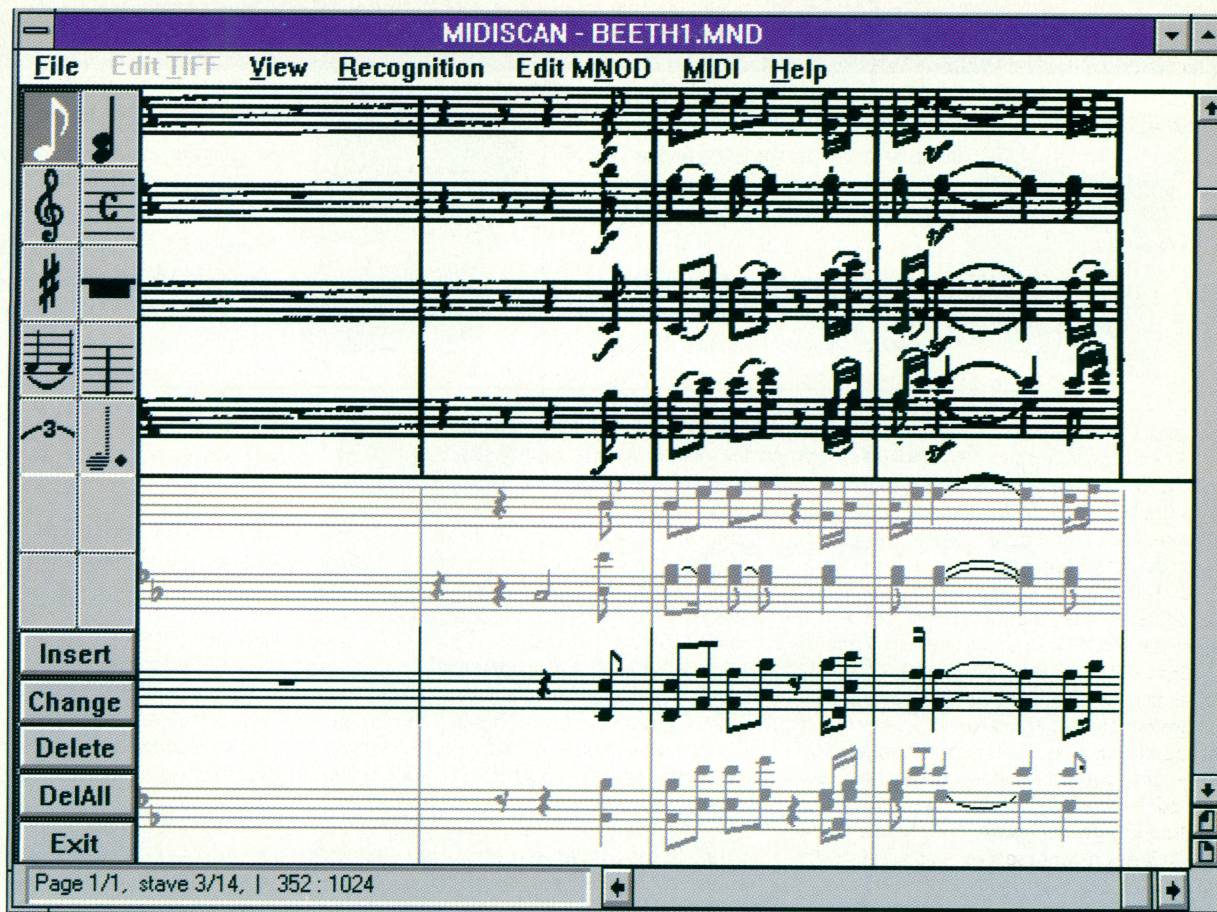
**Copy Protection:** Not copy-protected.

**Suggested Retail Price:** \$379.

**Contact:** Musitek, 410 Bryant Circle, Suite K, Ojai, CA 93023. (805) 646-8051. Fax (805) 646-8099.



In Midiscan's editing environment, the original scanned image is shown in the top half of the window, while the musical interpretation (in a format called Music Notation Object Description, or *MNOD*) appears in the bottom half. The *MNOD* document must be edited using the toolbox at left before it is output as a MIDI file. Note the incorrect rhythm values, extra noteheads, and missing rests in the *MNOD* version.



should be able to find them. Ledger lines right at the end of a staff sometimes cause confusion, however. It's necessary to watch the screen like a hawk while staves are being located, as this is the only way to know whether you need to rerun the process with manual correction. Manual correction is a simple matter on one level — you drag any mislocated staff start and end markers around on the screen by hand so that they are positioned correctly. The trouble is, you can't tell the program, "Staff 15 is mislocated; let me correct that one." If you spot an error during the automatic location process, you must rerun the process with manual confirmation (that is, clicking on the "accept" button over and over) for the entire page.

The program can get so disoriented by extraneous marks in the score that it issues an error message and waits for the cavalry to arrive. In particular, ties and *ottava* marks that run the whole width of the staff can prevent it from locating staves. For such emergencies, Midiscan includes a simple TIFF editor. You can draw a rectangle around the offending marks with the mouse, and then hit <DELETE>, which is a heck of a lot easier than using white-out on your original prior to scanning. Copying and pasting commands are also available in the TIFF editor, but are still buggy. Once we had selected and copied an area, we could drag it around the

## PROS & CONS

**Pros:** Successfully translates full scores into Standard MIDI Files. Works with any TIFF scanner.

**Cons:** Raw output must be extensively hand-corrected to be usable. Doesn't translate dynamics or articulations.

**Bottom Line:** If you've had more than two years of piano lessons, you can create a MIDI file faster than Midiscan can.

screen, but there appeared to be no way to release it so as to select another area. No big deal: Copying and pasting in this part of the program is something most users will never need to do.

After locating the staves, the program asks you to confirm how many systems are on the page, and how many staves are in each system. It makes a guess about these parameters, but variations in the vertical spacing can confuse it. This is where the fun starts. We found that when an orchestral score varied from one page to the next in the number of staves present per system or the number of systems per page, Midiscan was not able to cope. It assumed that the information we provided for the first page was valid throughout a multi-page score. In fact, Midiscan has no input structure that would al-

low you to tell it which staves have been omitted from which systems. The owner's manual provides a workaround that addresses this limitation, at least with piano/vocal music in which some systems have a vocal line and some don't. What you do is, you tell the software that each system contains the maximum number of staves found in any system. Then, after it "locates" the nonexistent staves, you move the locator boxes up into the empty space between systems.

If your orchestral score begins, as many do, with a single huge system occupying the whole first page, after which two or more systems are displayed per page on later pages, this workaround won't help. Midiscan will assume that the following pages contain only one huge system as well. If you want to use the software



# Best of Guitar Player®



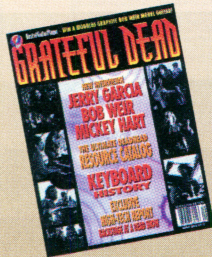
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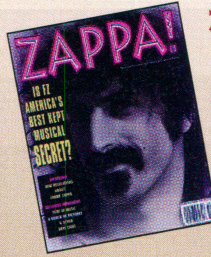
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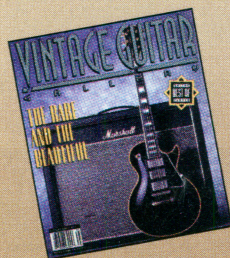
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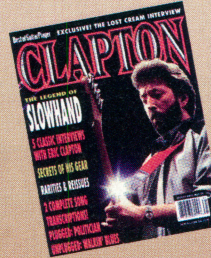
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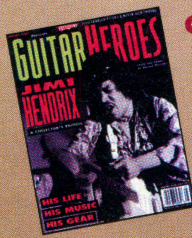
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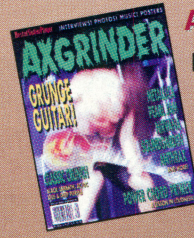
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SEKM03



## MUSITEK MIDISCAN

on a score that has serious variations in system size, it would probably be easier to turn each page into a separate MIDI file and then assemble the MIDI files into a single piece in your sequencer or notation program.

Once Midiscan understands the staff/system layout, it sets to work converting each staff's notes into objects in its own MNOD (Music Notation Object Description) language. This process takes from five seconds to a minute per staff, depending on the complexity of the music. Again, the computer does its thing while you watch. (There is a cancel button, but that's it for user controls.) With a multi-page score, you can safely go grab lunch and come back afterward. When the whole score has been processed, you'll be asked for a filename so the MNOD output can be saved. It might be better if the program asked you for the filename ahead of time, and stored the output automatically at the end of the process. As it is, if you have a flat tire coming back from lunch, and then there's a power outage, the MNOD output will be lost. This is a picky point, though. The nuts-and-bolts difficulties are still waiting in the wings.

**The Land of MNOD.** After you've saved your MNOD file, it will be displayed by Midiscan in a friendly way: The upper half of the window shows the original TIFF file, while the lower half shows the corresponding MNOD objects arranged in precisely the same manner. The scroll bar at the right side of the window scrolls both displays in sync. Comparing the original with the Midiscan version is as easy as moving your eyes up and down. While we didn't invite any musical illiterates in to test the program, it looks as if you could edit an MNOD file simply by matching the appearance of objects.

You can zoom the image in or out, which is handy, because at high zoom resolutions it's tough to tell exactly where you are in the music, while at a zoom resolution low enough to show the entire width of a 7-1/2" staff, the MNOD noteheads are clunky and hard to read. With half-note heads, the interior of a head that's on a line looks identical to one that's on a space. We were using a super-VGA monitor, so the screen resolution wasn't the source of the problem. We're told that the next version of the software will ship with a notation font that will make the MNOD display easier to read.

Midiscan makes no attempt to replicate such score objects as dynamic marks, articulation marks, and text. Nor does it recognize grace notes. It translates whatever it sees into one of the following object types: five-line staves; notes of various values, including dotted and tied notes; rests; bar lines, including double bars and repeat indicators; accidentals, including key signatures; time signatures; and clefs. Because the object list is limited, Midiscan wouldn't work well as an input system for cleaning up and republishing old sheet music. By the time you scan and edit the file, import it into your notation program, and then go to all the trouble of reentering the missing symbols, it would almost certainly be faster to input the whole score into a notation program from scratch.

With simple, clear sheet music, Midiscan does a reasonable job of interpretation. Bar lines, key and time signatures, clefs — everything will be just where it ought to be. Even so, you'll find the score sprinkled with such oddities as wrong rhythm values, accidentals and articulation marks interpreted as notes, and missing notes. Before converting it to a MIDI file, you'll need to do a little cleanup work... or maybe a lot.

If you think about it for a minute, it's easy to see why this is so. Midiscan is dealing, at the input stage, strictly with blobs of black separated by areas of white. If there's a white spot in the middle of a black blob, it has to decide whether it's looking at a half-note head, a whole-note head, a flat, natural, or sharp, a lower-case *p*, or perhaps the gap between two slanting beams in a sixteenth-note group. If there's no white spot in the middle of the blob, is the blob a notehead, some sort of rest, or what? How much curvature and/or thickness does the program need to see in order to tell the difference between a beam and a slur? What happens when the publisher has crammed the staves so close together that notes on ledger lines actually fall closer to a higher or lower staff than to the staff they're attached to? You get the idea.

**Cleaning Up the File.** Don't confuse Midiscan with a full-featured notation program. Its editing environment is designed solely to alter rhythms and pitches so as to generate a clean MIDI file. For this purpose, a toolbox or palette of symbols is provided along the left side of the screen. Actually, eight different toolboxes, plus a "master toolbox" that accesses the others. Palettes are available for notes, rests, clefs, time signatures, ties, accidentals, bar lines, and tuplets.

Let's say you've got some wrong pitches and rhythms to deal with. You click on the note icon, which opens up a toolbox containing notes of various rhythm values. Next, click on the insert, change, or delete button. If Midiscan has left out some of the notes in the bar, choose "insert" and the correct rhythm value, then click on the staff at the appropriate spot. Midiscan thoughtfully provides ledger lines as visual guides if you move the mouse above or below the staff. If a *pp* marking has been interpreted as a couple of whole-notes below the staff, choose "delete" and click on the noteheads, and they're gone. If sixteenths have been transcribed as eighths or quarters, hit the "change" button and the icon with the correct rhythm value, and then click on the note. It will instantly be edited to reflect the new rhythm.

Midiscan makes no attempt to get the proper number of beats into any bar. That's up to you. If you stack one note on top of another to create a chord while the basic quarter-note tool is selected, you won't get the correct rhythm, even though the chord appears correct on the screen. Instead, you need to click on the chord icon to insert or delete notes within a chord. If the entire chord is missing, it's a bit tricky at first to remember that you have to insert the first note with the correct rhythm value tool and then switch to the chord icon for the remainder of the chord, but you get the hang of

it quickly enough.

Midiscan deals intelligently with accidentals, dots, and ties. When you add a dot to a note in a chord, all notes in the same chord are automatically dotted. You enter an accidental by clicking on the notehead after choosing "insert," and delete it the same way after choosing "delete." When you insert or delete an accidental as part of the key signature, it is automatically placed on the correct line or space. (This does prevent the use of non-standard key signatures; if you're transcribing a Bartók piece, you'll have to edit the relevant pitches in the sequencer.) To tie two notes together, you simply choose the tie tool and click on the first of the two noteheads. Since this is not a publishing program, there's no need for amenities like adjustable tie curvature.

What the program does need, however, are some utilities for the editing environment. At present there is no undo command, and block cut/copy/paste is not supported. The absence of undo is especially galling, because it's fairly easy to insert a note at a pitch one step higher or lower than you intended by clicking in the wrong spot. Since you can't hit <CTRL>-Z to undo your action, you have to click the delete button, click on the offending note, then reselect insert and put the note where it belongs. Yeah, that's only three extra clicks — but the rest of the editing environment is just as slow.

Midiscan assumes that you listed your TIFF files in the correct order. If you should discover after starting to edit that a page is out of sequence, you can't shift it. Your options are to start over (which wastes all of your editing work) or to finish the file and then change the structure of the music after importing the MIDI file into the sequencer.

Another minor limitation has to do with what happens at the top and bottom of the screen. The MNOD environment extends only as far up and down as the original scan. If a few of the lowest bass clef notes are chopped off at the bottom of the lowest staff, you won't be able to insert them with the MNOD editor, because the mouse can't be moved down to the position where they ought to be placed. The missing notes must be added to the MIDI file itself in the sequencer. This could cause some added inconvenience when physically large scores are being scanned.

**The Acid Test.** The ultimate question, of course, is whether at the end of this process you have a MIDI file that sounds like the sheet music when you play it. The short answer: Yes. We were able to load Midiscan's MIDI file output directly into a sequencer and play it, with only minimal tweaking in the sequencer. The music was identifiable, and contained no wrong notes or other anomalies — though we charitably ignored missing trills and grace notes.

Midiscan assigns each staff to its own MIDI channel, which is why it can only handle 16-staff systems. (Larger systems can be scanned, but you must tell Midiscan which staves to skip.) It also inserts the program change of your choice at the top of the MIDI track. That's it for MIDI editing power; all other fine-tuning must be done in the sequencer.



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## MUSITEK MIDISCAN

After getting familiar with Midiscan, we ran a time trial. From the *Keyboard* archives we grabbed a Dover volume of Mozart piano concertos in full score. With the stopwatch running, we scanned the first two pages of *Concerto No. 17*, which is scored on ten staves for flutes, oboes, bassoons, horns, piano, and strings. (The piano part in this section contained only rests, so in effect we were working with an eight-staff score.) The biggest single problem in the MNOD file, though not the only problem by any means, was Midiscan's inability to understand half-notes with double slash-marks through the stems — the customary way of representing a repeating sixteenth-note accompaniment part. It could be argued that we should have found a passage that didn't have this type of notation, and used it for the test instead. The trouble is, music notation is full of peculiar conventions. A test passage that contained no oddities would be a very odd passage, not a truly representative test.

After correcting the MNOD file, we saved the results as a MIDI file and loaded this into a sequencer. On auditioning it, we found a few mistakes we had missed, so we went back to Midiscan, fixed the mistakes, and saved a revised MIDI file. Total elapsed time to prepare a perfect file: 105 minutes. To be charitable, let's shave ten minutes off that figure to compensate for the extra time it took us to turn all those half-notes with slash marks into sixteenth-notes. Let's call Midiscan's time 95 minutes.

Next, we plugged in a MIDI keyboard and recorded the same music manually, directly into the sequencer. In order to make the test as fair as possible, we used a sequencer that we weren't completely familiar with, and that has a somewhat clumsy, awkward design. We felt this would compensate for the fact that we're not total wizards working with Midiscan either — although Midiscan is so simple to use that we're not sure a virtuoso could have done the job much faster. (Besides, much of its time was taken up with automatic processing, not user input.) The musician recording the sequencer tracks was not a keyboard whiz by any means, but was a trained musician.

After recording the eight sequencer tracks, we corrected wrong notes and quantized the parts so that the playback would sound more like Midiscan's perfectly quantized output. Elapsed time: 50 minutes. Better sight-readers working with their favorite sequencer could probably cut this time in half.

There you have it: In its current state, Midiscan is at best half as fast as a trained musician with a modest keyboard facility. And don't forget — its MIDI file output contains no changes in key velocity, and all notes are played with their full duration. Even without fine-tuning, our manually played version contained more musical legato/staccato articulations and velocity variations than Midiscan's output. If we had skipped the quantization and paid closer attention to playing expressively, we could have come up with a fairly listenable Mozart

orchestration and still beaten Midiscan's time. In our opinion, few musicians will be satisfied to listen to Midiscan's MIDI file output. Even after the mistakes are edited out, the music will need extensive handwork in the sequencer before it begins to resemble anything that human ears will accept as musical. And we do mean handwork: changing the duration and velocity of one note at a time, for hundreds or thousands of notes.

This is a crucial difference between optical character recognition for text and optical recognition for sheet music, one whose importance has perhaps not yet been adequately evaluated: When you've spell-checked and proofread a text, you've restored the document completely. Its nuances are fully present in exactly the form that the author intended. A corrected Midiscan file, on the other hand, provides only a raw starting point for music, a mechanical rendition that would leave the composer grinding his or her teeth. It's not just that Midiscan can't deal with dynamics and accent marks, though that's a real issue. Much of the information provided by musical nuance was never in the score to begin with, so Midiscan can't produce a performance file that incorporates it.

**Conclusions.** Plenty of folks have spent years wishing for this type of software. We hope Musitek gets some solid support in the marketplace, because their program has real potential. They've courageously tackled some truly thorny software issues, and their product does successfully perform the tasks it's designed to perform. On the other hand, we have to wonder whether people who feel that score recognition software will enhance their musical lives are going to be happy for long with Midiscan, once the novelty value wears off. Correcting the inevitable errors in its files is not only time-consuming but a thoroughly tedious business.

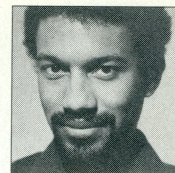
If your customary method of getting sheet music into your sequencer is via step entry, or if you can't read music at all but are patient and meticulous, or if you have a physical handicap, you might find Midiscan useful. You don't have to be Horowitz to outrun it, though; by slowing the sequencer clock down far enough, almost anybody can hunt and peck their way through a score and create a file equal or superior to Midiscan's output.

The program's user interface needs to be streamlined and enhanced, and the recognition algorithms could use turbo-charging as well. More important, Midiscan's output is a very incomplete representation of music. Performance and interpretive skills are required to get it to sound good. And if you've got performance and interpretive skills, why do you need Midiscan? Will you have the patience to edit its MIDI files at the event level, when you could be playing them yourself and letting your intuition do the detail work? Left to its own devices, Midiscan generates a MIDI file that sounds like — well, like a high-tech hurdy-gurdy, not a musical ensemble. If you're a dedicated technophile, buy a copy and amaze your friends. Otherwise, practice your sight-reading and wait for next year. ■



# DISCOVERIES

TITUS LEVI



## MEHMET OKONSAR

**Style:** Classical & contemporary.

**Age:** 32.

**Influences:** Chick Corea, Herbie Hancock, Cecil Taylor, Paul Hindemith, George Gershwin, Franz Liszt, Alexander Scriabin, Olivier Messiaen.

**Main Instrument:** Kawai EX concert grand piano.

**Contact:** Mesnevi Sokak 46/15, 06690 Ankara, Turkey. (011-90-4) 438-0917.

IT'S HIGH TIME FOR ANOTHER BATCH OF PIANISTS. THIS month's crop is heavy on notes — that is, they have an affinity for dense, thick textures. Toby Kasavan and Mark Hennen, playing together, draw from the Romantic *sturm und drang* tradition. And boogie-woogie. And barrelhouse blues, and ragtime, and jazz. Then the duo feeds these jumbled roots a diet of postmodern music steroids, heavy on the angst, and peppers it all with plenty of speed. Notes rip from the keys in cascades. Melodies blow in powerful gusts and gales.

Like Kasavan and Hennen, Mehmet Okonsar draws from a combination of German music and jazz. But where the duo leans toward the moodier aspect of German repertoire and the more hyperkinetic aspects of jazz, Okonsar draws from structural influences, combining the rigorous formalism of Hindemith with the fluidity and suppleness of jazz. Chord after hefty chord churns to build up bass swells and mid-range waves that sweep over the melodies and carry them to and fro. Even when he taps out single notes with his left hand like a delirious telegraph operator, his polyrhythms and shifting tonalities create a somewhat soupy effect.

## HONORABLE MENTION

### ALLAN "ALFY" BETZ

**Style:** Contemporary classical & electronic, w/ pop & new age overtones.

**Influences:** Bach, Mozart, the Beatles, Jimi Hendrix, Keith Emerson.

**Contact:** 1306 Walcott Dr., Ogden, UT 84403.

Betz's ambitious pieces lie somewhere between new age in feel and prog rock and electronic concept albums in scale. Lots of thought and care buttress the structures and frame the moods of his music. In places some emotional punch is lost where the playing becomes rhythmically brittle, but his current projects show definite promise.

Kasavan and Hennen have been working together since the '70s, when Kasavan moved into a New York loft after leaving L.A. For all the whirling and frenetic energy of their music, Kasavan considers the logistics of performance a greater problem than accessibility. "There's something about the sound of the piano that makes what we do listenable," he notes. "But it's tough finding halls that have two good pianos. Mark works as a piano rebuilder, so there are always two or more instruments in his loft. We've played concerts there, and at St. Peter's [New York's "jazz church"], but we've had to go toward the 'new music' scene and universities just to find someplace to play."

Few such difficulties encumber Okonsar's career. "I have a government-sponsored residency, which is essentially the same as the 'People's Artist' awards in the old USSR," he says. "[This means] I perform a number of times during the year and also serve as a kind of musical ambassador." This residency also provides Okonsar with a stipend that allows him to focus on performing. His busy schedule involves soloing with orchestras in Turkey, teaching master classes in Turkey, Italy, and Japan, and working on a wide variety of Liszt pieces in preparation for a possible recording project. (Okonsar's credits actually include an out-of-print LP titled *Mehmet Okonsar Plays Liszt*, released in 1987 on the Euro-Star label.) Occasionally he gets a chance to do some composing as well.

As for Kasavan and Hennen, they can be heard on *Theory of Everything*, available on cassette and CD from Stork Music at the address noted above. Kasavan has also recorded with members of P-Funk and still works in a variety of soul, funk, and R&B gigs. Hennen can be heard with the William Hooker Quartet on *Lifeline*, out on the Silkheart label in Sweden, as well as on a number of Stork releases.



## TOBY KASAVAN & MARK HENNEN

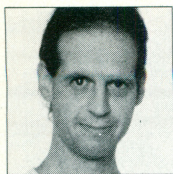
**Style:** Post-Cecil Taylor jazz. **Ages:** 41 (TK), 42 (MH).

**Influences:** Thelonious Monk, Béla Bartók, Ornette Coleman, Count Basie, Cecil Taylor, Sun Ra, & others too numerous to list.

**Main Instruments:** Steinway grand piano (MH), Steinway upright, Korg Wavestation SR, E-mu Proteus/1, Roland A-30, Yamaha KX88, Alesis HR-16 (TK). **Contact:** Stork Music, Box 76, Canal Street Stn., New York, NY 10013. (212) 732-8828 (MH).

Titus Levi, founder of the California Outside Music Association, spends his free time struggling through graduate economics courses at U.C. Irvine. If you'd like to appear in Discoveries, send a cassette of your best material (full name, age, style, influences, performance credits, future plans, and equipment), a publishable phone number and address at which readers may contact you, and a clear black-and-white photo of yourself with your keyboard setup. Photos should be labelled with your name and the photographer's name and address. All styles of music will be considered. Due to number of submissions, material cannot be returned, and applicants will not be contacted unless accepted. Send all correspondence to Titus Levi, 5135 Hanbury St., Long Beach, CA 90808. Titus also invites Discoveries alumni to keep in touch with news about career advances, and would like to hear from more artists who use non-keyboard triggering devices or interactive computer software.





# INSIDE THE MUSIC

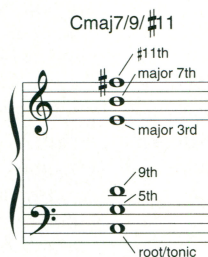
DAVE STEWART

## 150 CHORDS ARE ALL YOU NEED

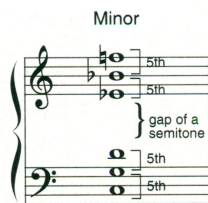
**A**S IF TO UNDERMINE ALL MY EFFORTS to impart a degree of harmonic literacy to the *Keyboard* readership, an English company called Songbooks Unlimited is running a press campaign with the slogan "Just Three Chords Are All You Need!" Oh yeah? The ad continues: "Now you can avoid all the complicated chord changes and harmonies." But they're the best bit, you fools! "Each song has been simplified to its essence with all the extraneous frills removed, so that more people can enjoy playing these songs. Be prepared for your next sing-along!" Oh, God. I still haven't recovered from an incident at a wedding three years ago when the organist played the whole of "Jerusalem" on straight major changes, and now this — it's more than flesh and blood can stand. Songbooks Unlimited conclude their attack on all that I hold dear by offering the reader their book *150 Songs with Just Three Chords*. Titles include, and I quote, "Put Your Arms Around Me Honey," "When You And I Were Young, Maggie," and "Come Josephine in My Flying Machine." (!?)

Quite apart from the indignity of seeing 25 years of intensive chordal study dismissed as "extraneous frills," I can see that if this way of thinking catches on, there's a real danger I'll be out of a job. Consequently, I have prepared my own rival publication, *Three Songs with Just 150 Chords*. Casting a fond eye back to the halcyon days of progressive rock, this features three of my most popular mid-'70s compositions, each one using a minimum of 150 chords and lasting at least 20 minutes, sensibly priced at only £175.99. If this sells well, I have a second volume planned, *150 Songs with Just Three Words*. Tired of forgetting song lyrics? This book brings you favourite selections from great monosyllabic bands like the Damned and the Troggs, with all extraneous adjectives, fanciful phrases, and non-essential metaphors removed. Titles include "Girl, Girl, Girl," "Shut Your Face," and "She's a Drag." A breeze to memorise, and a snip at only £235 plus £25 p & p.

(Drops hectic, jocular style and adopts serious, quasi-academic tone:) Last month — I've had flu in the meantime, you'd never know it from my picture, would you? — I left you pondering the meaning of a pair of exotic harmonic edifices named  $Cmaj7/9/\sharp 11$  and  $Cm7/9/11$ . Here they are again:



The chords, obviously closely related, are constructed on an identical left hand which consists of a pair of stacked or "consecutive" fifths (C, G, and D). The right hand also plays a pair of fifths, based on an E in the major version — E, B, and F# — and an Eb in the minor version — Eb, Bb, and F. We could say that both shapes feature a pair of fifths in each hand, with the hands separated by a tone in the major version, and a semitone in the minor version:



What does one do with chords like this? They have a very colourful sound, possibly too colourful for everyday use. Feature them

too heavily, and your music could begin to sound like the conversation of someone trying to impress with a lot of difficult words: "Morning, Mrs. Jones. Yes, *zygomatic* kind of day, isn't it? *Notwithstanding*, the *verdancy* of the *arboraceous environs* is *unsurpassably pulchritudinous*, if you'll pardon my *periphrasis*." "\*\*\*\* off, you clever \*\*\*\*\*," comes the swift, sadly inevitable rejoinder. Not one to be put off by a few asterisks, I was bold enough, in my youth, to compose the passage shown in Example 1, based entirely on these shapes. (Note to those with smaller hands: If you have trouble making the stretches on these voicings, ignore the tempo and bar lines and play each chord separately as a broken arpeggio with the sustain pedal down. It also helps to lower the hands in relation to the keyboard and press the end, rather than the middle, of each key. The main thing is to get to know which notes are used in each chord!)

Phil Miller, the guitarist of the band I was in at the time, was required to play a solo over these changes, and a good job he made of it too — the combination of ever-shifting tonal centres and awkward rhythmic placement makes this passage something of a minefield for soloists! The section concludes with seven further bars of music (Example 2), wherein other chord shapes begin to infiltrate the  $maj7/9/\sharp 11$ s and  $m7/9/11$ s. On these seven bars, the guitarist plays a written melody line, and the whole group pause on the final  $Bb7/9/\sharp 11$  chord before plunging into, if memory serves, a funky 4/4 section in B minor. I can remember someone from the record company nervously complaining that we faded the B minor section too early — "It's the best bit," he wailed. At the time, we thought he was mad, but on reflection, though I hate to admit it, I think he was probably right. There — I've publicly sided with a record company edict, for the first time ever. Another scoop for *Keyboard*! For other astonishing revelations and groovy chords, tune in to next month's *Inside The Music*, the column that aims to amuse, inform, and entertain, while simultaneously paying the writer's mortgage. ■

Dave Stewart is descended from a tribe of monkeys with huge, hairy hands and small brains. Send your messages (ape language only) and/or bananas to him and Barbara Gaskin c/o Broken Records, 18 Yeomen Way, Hainault, Ilford, Essex IG6 2RN, England.



Ex. 1. A sequence of consecutive-fifth chords that I composed in my unbridled youth.

♩ = 80

Cmaj7/9/#11 Gbmaj7/9/#11 Cmaj7/9/#11 Gbmaj7/9/#11 Ebmaj7/9/#11 Amaj7/9/#11

Cm7/9/11 F#m7/9/11 Cm7/9/11 F#m7/9/11 Ebm7/9/11 Am7/9/11

Cmaj7/9/#11 Gbmaj7/9/#11 Cmaj7/9/#11 Gbmaj7/9/#11 Ebmaj7/9/#11 Bmaj7/9/#11

(as bar 1) (as bar 2)

Ex. 2. Seven more bars of music from the progressive tune quoted in Ex. 1.

guitar (concert pitch)

Bb9 Gm7sus4 A/Dmaj7 Dm9/F Gm9/Bb

Gm7/9/11 Ebmaj7/9/#11 Bb9 Am7 Bb7/9/#11



## DIGITECH TSR-24

MULTI-EFFECTS PROCESSOR

By Greg Rule

**L**OOKING FOR A MULTI-EFFECTS processor? From Alesis to Zoom, there are plenty to choose from these days — especially in the \$500-or-less and \$1,000-and-above price ranges. If your budget falls somewhere in between, there are four units currently in production (not counting the glut of guitar-oriented effects devices): ART's DR-X 2100 Studio Edition (\$639), Boss's SE-70 (\$895), Peavey's 20/20 (\$699), and DigiTech's new TSR-24. At \$799, the TSR boasts true stereo multi-effects, programmable effects chains, discrete audio ins and outs, real-time MIDI control, and expandable memory. It's the company's flagship processor, and the first product in their line to feature an all-new S/DISC microprocessor. We won't bore you with mathematical details; we'll simply say that the S/DISC's power is evidenced by the TSR's programming prowess and exceptional sound quality.

**Overview.** Aimed primarily at sound-reinforcement folks, recording studios, and keyboardists, the TSR-24 offers a well-rounded palette of effect types: reverbs (6), EQs (8), delays (16), pitch shifters (10), choruses (5), flangers (4), one-shot samplers (5), tremolo/auto panners (3), noise reduction modules (4), and mixers (12). There are 233 patches in all — the first 128 are user-programmable, the remainder are ROM-based factory presets. A forthcoming expansion card, the PPC-200, provides a second S/DISC processor, and doubles

the on-board memory.

The TSR's front panel is loaded with buttons and knobs. Standouts include four programmable shortcut buttons (they provide instant access to the most commonly used parameters within any given program) and a compare button for toggling between an edited and original patch. On the back panel, you'll find two audio ins and four audio outs (all quarter-inch), a programmable footswitch in, and MIDI in, out, and thru.

Despite its deep programming options, the TSR is a relatively friendly machine to learn and operate. It has a linear architecture rather than a tree of submenus, so pushing the forward or backward parameter buttons while in a patch will cycle you through the various options. The only operational bummer we found was with patch selection: There's no numeric keypad. Unless you're sending patch changes from a MIDI device, you'll have to spin the data wheel or hold the up or down arrow to scroll through the patches. (Thankfully, the patches wrap around from 233 to 0, and vice-versa.)

When we first unpacked the TSR-24, we plugged it in, turned it on, and attempted to select, edit, and save a patch without looking at the manual (yes, the idiot test). No problem there. Only when we attempted to assign MIDI controllers to various parameters and the like

did we need to look at the owner's manual. The manual is well-written, educational, and chock-full of useful diagrams, illustrations, and tutorials. All it lacks is an index.

Where does the TSR-24 fit in the marketplace? In the \$600 - \$1,000 price range, the competitive ART and Peavey offer more patches, and the Boss SE-70 has a wider range of effect types (including vocoder and distortion algorithms), but all are less programmable and have fewer audio outs the TSR-24.

**Programming.** This is where the TSR-24 really shines. Patches can be built from the ground up — either by choosing factory algorithms, or by assembling them yourself. What's an algorithm? It's simply an effect, or a combination of effects, and their associated parameters and signal routings (see Figure 1).

When building your own patches, you can designate the order and routing of each effect. You could, for example, start with a reverb, then send its output to a chorus, then on to an EQ module, and so on. Redundant effects are also possible. The order in which you place a group of effects can considerably affect the sound. A signal routed through a delay and then a reverb, for example, will sound different than the same signal passing through a reverb first and a delay second.

So how many effects can you string together? You're limited only by the TSR's available memory and processing power. As to be expected, some effects chew more memory than others. A GigaVerb algorithm — the most powerful reverb in the TSR — consumes nearly all of the available memory. BigVerb, on the other hand, takes less than half of that amount. And the MFX (multi-effects) reverb requires only half the space of BigVerb. As you'd expect, there's a tradeoff: Reverbs that use less memory don't have as rich or full a sound. DigiTech thoughtfully included a chart in the back of the manual that lists each effect and its associated memory load. In general, you can expect the TSR to handle three, four, or maybe five effects chores at a time.

Speaking of memory, there are a total of 512 "blocks" available — 256 for RAM, and 256 for the CPU. The CPU blocks are devoted to processing tasks, while the RAM blocks are for temporary data storage. One block equals one kilobyte.

Let's examine one of the TSR's patches. Patch 1, "Big & Brite Rev" (which uses the GigaVerb algorithm) offers 28 parameters. Control over the reverb's early reflections includes predelay, spread, shape, diffusion, and front- and back-level settings for quad systems (remember, the TSR-24 has four discrete outputs). Reverb controls include predelay, spread, crossover frequency, diffusion, high-frequency decay and rolloff, room size, mid and bass frequency and level, stereo blend, and quad delay times and levels. An MFX reverb, by way of comparison, offers only pre-



### PROS & CONS

**Pros:** User-configurable effects chains. Can function as two fully independent processors (two discrete ins, four discrete outs). Capable of quad "surround sound" effects.

**Cons:** Sluggish response to patch changes. Occasional noisy artifacts while switching patches.

**Bottom Line:** A powerful, flexible, great-sounding effects processor.

### DIGITECH TSR-24

**Description:** Multi-effects processor.

**Main Features:** Full-bandwidth effects (20 - 20kHz), 128 user-programmable patches, 233 total patches, multiple effects per patch, user-definable effect chains, 48kHz sample rate, two audio ins and four outs are independently addressable, real-time MIDI control over any parameter, expandable memory, programmable footswitch, 32-character backlit LCD.

**Suggested Retail Price:** \$799.95.

**Contact:** DigiTech, 8760 S. Sandy Pkwy., Sandy, UT 84070. (801) 566-8800. Fax (801) 262-4966.



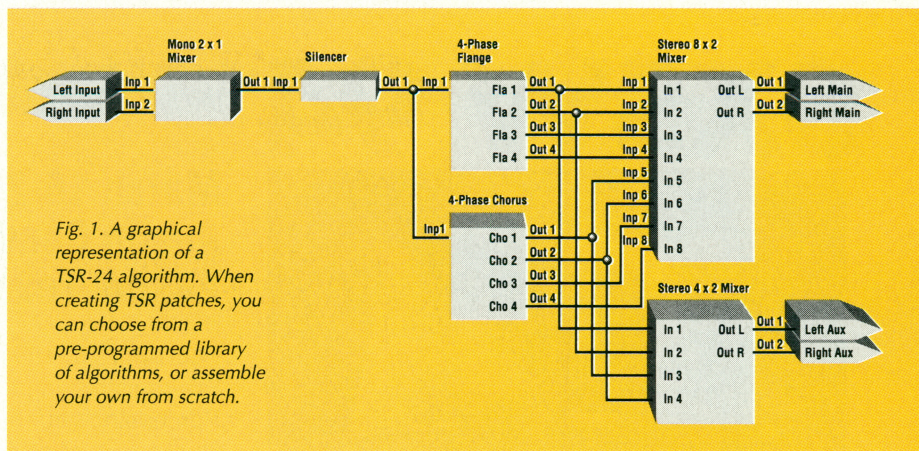


Small size, big performance: The DigiTech TSR-24 is loaded with front panel controls and offers a full plate of effect types — including reverbs, EQs, delays, pitch shifters, choruses, flangers, one-shot samplers, tremolo/auto panners, noise reduction modules, and more.

delay, spread, diffusion, high-frequency decay and rolloff, size, reverb time, and level.

The EQ group offers 6-, 10-, and 15-band graphic, low- or highpass filter, and 1-, 3-, or 5-band parametric equalization. With the 5-band parametric module, for example, high and low shelving controls (each with selectable frequency) and Q (filter) are programmable. The delay group offers four mono, three stereo, four one-in/two-out, and four one-in/four-out variations. With each, the number of taps is programmable, as are the delay level, delay time, and volume ramp (among other things). The maximum delay time offered is five seconds, expandable to ten with the upgrade. Perhaps the only major omissions from the effects group are compression and distortion. Speaking of distortion, we're told DigiTech plans to unveil a new TSR-family processor in the near future aimed at the guitar market.

**MIDI.** Plug a MIDI device into the TSR-24 and . . . yeeeah boy! On the most basic level, it can send and receive data on any of 16 channels (including sys-ex dumps), and can remap incoming program changes. It also offers MIDI input filtering, and can merge incoming data with its own output. But the real power lies in its real-time performance functions, in which continuous controllers can be mapped to any active parameters — up to four local parameters



per patch. Use a mod wheel to open or close the filter, for example, or map a slider to reverb room size. If you devote some time to this, you can come up with some very expressive real-time effects.

In case you're wondering, MIDI continuous controllers and channel pressure are the only control sources recognized by the TSR — note numbers, velocity and pitch-bend are not accepted. And if you're hoping to sync the delay to MIDI clocks, sorry. On the upside, though,

the TSR can function as a MIDI multiplexer: When a program change is received, the TSR's device mapping feature can in turn transmit up to four program changes on four different MIDI channels to other devices in the MIDI chain.

The only significant shortcoming we noticed when testing the MIDI functions of the TSR-24 was the speed with which patches responded to program changes. Whether the program changes were sent via MIDI or selected

*Continued on page 152*



# Rock n Roll

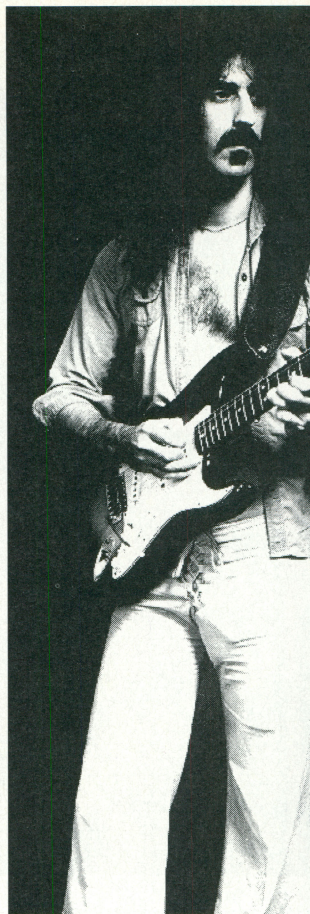
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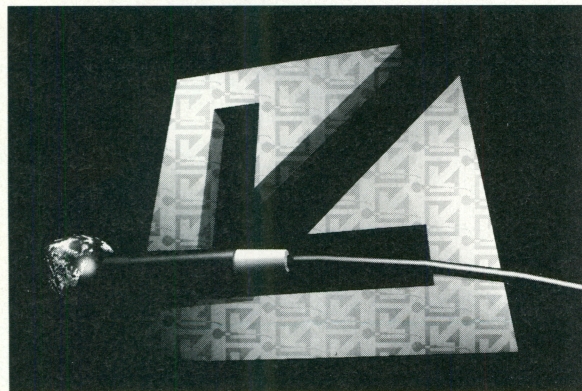


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# REEL WORLD NOTEBOOK



J E F F R O N A

## THE LEVEL PLAYING FIELD—PART 2 PROJECT: THE LIPSTICK CAMERA

**I**N MY LAST NOTEBOOK, I DESCRIBED the less-than-smooth beginning of a film scoring project. After much hand-wringing and deep philosophical discussions with the filmmakers, I finally got the creative green light to write the score I felt would best serve the film.

One of the great challenges that any of you interested in film scoring will have is working with a first time director. They are nervous, often clumsy, and highly opinionated. Picture a deer staring into the headlights of a Mack truck, telling you how well they know how to drive. It is your job to serve them, yet guide them at the same time by your own experience and musical sense. Unlike the other technical aspects of movie-making, such as lighting, photography, and editing, few directors have a grasp of the technicalities of musical scoring, and that often frustrates the hell out of them. They can't tell you how to do what they want ("Wouldn't an *Al minor* be better when we see her face?") when they want something changed. It's your job to realize their vision in a way that lets them feel that they are at least partially in control (even if that requires acting lessons on your part).

After I completed composing the score to *The Lipstick Camera*, I mixed each cue with the director present in the studio. This was the only way to be sure that each piece was acceptable to him, and that there would be no big surprises at the final mix. He made a lot of last-minute changes, but he was very happy with the results. Also, since he had a hand in the music mixing process, the director had a sense of involvement that helped him like the music better.

The dubbing process brings together all the elements of the film's soundtrack, namely dialog, sound effects, and music. The dub takes place in a special studio designed to reproduce a theater environment with surround sound (see my Nov. and Dec. '93 columns on theatrical surround sound). The dialog and effects for this film were spread out over two 24-track analog tape recorders. Music is typically given six or more tracks, with separate tracks for percussion, melody instruments, or other special elements. However, I was instructed to provide no more than stereo mixes for everything. This makes for potential trouble. With a stereo mix, if a melody line or percussion instrument conflicts with any of the dialog, the entire cue must be lowered because you have no individual control over the offending element. The stereo mix was a compromise, made so a third multitrack would not have to be brought in (too expensive), and so the sound effects editors would not need to

be organized and use fewer tracks (too much bother for them).

Often, composers are not invited to be present at the dubbing sessions, since they are a highly sensitive lot, and tend to get offended when a piece of their music is either brought down to the threshold of audibility or tossed altogether. These events do occur, and sometimes with reason. Sometimes, a scene that appeared to cry out for music feels overwrought by the time the final dialog or effects are in place. It is essential to go into a dub with the open-mindedness to admit when a piece of your music simply doesn't belong in a scene.

I believe it's not only good, but essential for a composer (or someone intimately familiar with the score) to be present to assist in the event of a conflict with the music. Perhaps a cue can be brought in midway or faded out early while still remaining musical and not fighting with the other sound in any way. Sometimes the score needs a real advocate who will say, "The music should really be louder here for maximum impact on the scene."

The rule in film dubbing is, "*Dialog über alles*" — dialog over everything. Nothing can conflict with or distract from what the characters in the film are saying. What becomes more subjective is the use of sound effects, ambiance, and music relative to the dialog and to each other.

All of which brings me to a somewhat disturbing trend in film sound today: sound effects editors and designers being in charge of the final mix. There are some stellar exceptions, but sound effects have become so much larger than life in so many of today's films that music is getting squeezed out. Many current films feature bone-crushing door slams, gargantuan car screeches, massive footsteps, and other everyday effects raised to the threshold of pain. Don't get me wrong — I recognize the essential role that sound plays in providing psychological impact for a film. A well-done soundtrack can make a movie what it is (David Lynch's *Eraserhead* is a brilliant example). The answer is perspective. Each element in a film should happen either to help further the plot, develop the characters, or set an overall mood for a scene. The ancillary elements should be insignificant or not there. The musical score plays a fascinating role in films, since it is the only part of any film

which does not attempt to recreate a reality. It is the part of filmmaking that is closest to opera. It is cinematic poetry. Good sound effects can approach that level too, but since they cross so closely with reality, perspective becomes that much more important.

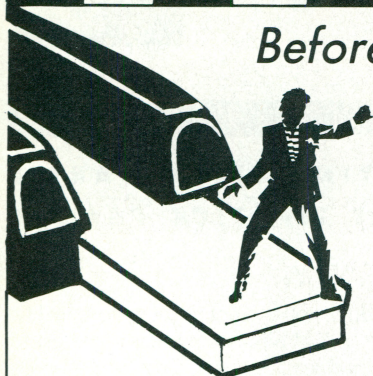
The dub for *The Lipstick Camera* was supervised by the sound effects editor, and it became clear early on that my music would be competing with voluminous crickets, traffic noise, distant TVs, and the like. I made it a point to sit as close as possible to the director throughout the three days of dubbing, so as to have his ear when I thought there was a real problem in sound balance. I did this for the scenes with music, since I knew how the music was to fit. For certain scenes where the ambiance and other sound effects had gotten totally out of hand (these sound guys really loved their noises!), I felt compelled to speak up to the director, and I did so. Before we got started, I asked for his express permission to add my input. Movie dubs are highly political affairs. Too many cooks will spoil the soup, and there is no going back after this. If it's a "fix in the mix" problem, then now is the time, because this is the mix. If your input is desired and requested, then give it. If it is not, then keep your mouth shut and take deep breaths. Everybody has an opinion, and between three sound people you're likely to get four of them. Defer to those in command, even if you know they are making a mistake. It's their movie and they can do whatever they want to ruin it — they don't need your help. In our dub, the director was in charge, but he knew little about sound mixing and believed everything the sound editors were telling him, which wasn't always the truth. I called their bluffs when I thought it was to the film's detriment, and the director was glad for my input

*Continued on page 153*

Jeff Rona is a composer, synthesist, writer, and educator in Los Angeles. He was chairman of the MMA for five years, and is currently co-ordinator of the UCLA Extension electronic music program.



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## ▲ SOFTWARE UPDATES

**ANOTHER ENCORE (MACINTOSH, IBM-PC).** Users will applaud the upgrades in Passport's latest version of **Encore. Version 3.0** (\$595; upgrade, \$99) of the composition and notation software includes cross-staff beaming, so you can extend beams across staves for multi-staff instruments, a slur function for automatically slurring between two selected notes with a single menu command, and a percussion staff for *notating rhythm* events on a single line. Also, you can now automatically notate guitar tablature for up to eight strings in any tuning. Notation can be displayed and edited on-screen, and played back as an entire score or as individual parts. MIDI controller changes can be inserted within the score, text and lyrics can be entered directly into the program, and multiple fonts can be used in a single text box. Encore 3.0 supports MIDI playback of dynamics, crescendi and decrescendi, repeats, endings, sustain pedal markings, and articulations on up to 32 MIDI channels. A score can contain multiple tem-

po changes and key and time signatures. Music is displayed and printed on systems of up to 64 staves with as many as eight independent voices per staff. In addition to support for EPS files, version 3.0 also supports Apple MIDI Manager. The software imports Standard MIDI Files and can transcribe sequences from any sequencer. Files can be transferred between the Macintosh and IBM-PC versions of Encore using Apple File Exchange. Passport Designs, 100 Stone Pine Rd., Half Moon Bay, CA 94019. (415) 726-0280. Fax (415) 726-2254.

**A QUEST FOR THE BEST (IBM-PC, MACINTOSH, AMIGA, ATARI ST).** Sound Quest has upgraded its universal editor/librarian yet again — **MIDI Quest 4.0** now supports over 180 MIDI devices and offers window icon bars, improved graphic editors with automated MIDI channel selection in multi/combi editors, and the ability to save data in four file formats. The new version is available for IBM-PC Windows 3.1 (\$319; upgrade from 3.0, \$75), IBM-PC DOS, Macintosh, Amiga, and



DEBBIE GREENBERG



Atari ST (\$299 each; upgrade from 3.0, \$59). The Windows version offers a fully native Windows graphic implementation, including standard fonts, sliders, and icons. Sound banks can be exported directly into Twelve Tone's Cake-walk, allowing patches to be selected by name while sequencing. Sound Quest, #2 - 131 W. 13th Ave., Vancouver, BC V5Y 1V8, Canada. (800) 667-3998. (604) 874-9499. Fax (604) 874-8971.

**DIEMER SEQUENCER (AMIGA).** With Diemer Development's **Sequel** (\$139) sequencing software, Amiga owners can record and produce 32-track tunes. The software's NotationList feature blends standard music symbols with the accuracy of an event list. Pitch, timing, velocity, and duration can be changed with the mouse, as can all MIDI control events. Rhythm can be corrected by quantizing arbitrary blocks to any standard beat, with adjustable threshold and strength. Each track can have many loops, each starting and ending anywhere. Loops can be nested, all repeat settings are adjustable, and straight tracks can be dubbed over the looping ones. MIDI and Amiga controls appear in Sequel's track-list display. The software also imports Standard MIDI Files and IFF files, exports Standard MIDI Files and tempo maps, and syncs to SMPTE via MIDI Time Code. Diemer Development, 12814 Landale St., Studio City, CA 91604. (818) 762-0804.

**BLUE RIBBON PACKAGES (IBM-PC).** Blue Ribbon Soundworks has

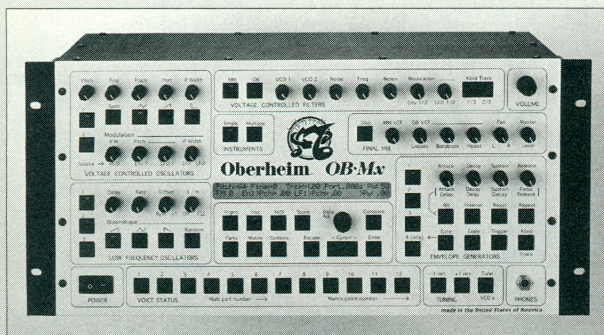
released the **SuperJam! Power Series** (\$29.95 each), six add-on packages for its SuperJam! composition software for Windows. The Classical, Cutting Edge, Dance Mix, Movie Soundtrack, Pop/Rock, and World Music Styles all include sample songs and new chord progressions.

When used with a soundcard, Blue Ribbon's **EasyKeys** (\$39.95) for Windows 3.1 simulates the functionality of an electronic keyboard. The General MIDI-compatible software offers 40 grooves, ten musical styles, and sound effects. JamBox records live performances, and Drums&Hits buttons allow you to trigger .WAV file sound effects as the music plays. Other features include an automatic melody maker, free-running solo mode, and one-touch chord playing. Blue Ribbon Soundworks, 1605 Chantilly Dr., Ste. 200, Atlanta, GA 30324. (404) 315-0212. (800) 226-0212. Fax (404) 315-0213.

## ▲ HARDWARE

**ELECTRO-VOICE SIMULATORS.** The EV/Dynacord **DLS 223** (\$1,180) digital Leslie speaker simulator replaces the Dynacord CLS-222. The DLS 223 provides rotary speaker and room simulations using a 24-bit digital processor. Rotational direction and speed, acceleration and slow-down rates, crossover frequency, and EQ parameters are programmable. You can store three cabinet/room simulations for recall from the unit's front panel or through MIDI. The MIDI-learn function eliminates the

## SPEC SPOTLIGHT



**ANALOG OBERHEIM.** Looking for a way to create rich, warm, and fat classic Oberheim sounds? Well, you can go straight to the source: Oberheim puts an end to your search with the MIDI-capable **OB-Mx**, an analog synthesizer that offers a true analog sound path. As an added bonus, the OB-Mx includes the original Minimoog-style filters, making it capable of reproducing vintage Minimoog sounds. Thirty-two knobs and 59 switches give you complete control at the front panel. Each of the 128 factory patches can be customized or replaced. Also, with Oberheim's matrix modulation, you can individually program or group together the OB-Mx's voices. The basic two-voice version lists for \$2,149. Dual-oscillator voice cards run \$769 each. A 12-voice version can be obtained for under \$6,000. Oberheim, 2230 Livingston St., Oakland, CA 94606. (510) 536-8600. (800) 279-4346. Fax (510) 261-1708.



## SPEC SHEET

need to know controller numbers. To program the MIDI function, hit a button and use the control source desired, then hit store.

Electro-Voice has also introduced the **DRP 10** (\$1,250), a stereo reverb and room simulator with 240 preset programs that are grouped according to application. The groups have speed buttons to quickly recall effects groups for vocals, guitars, bass, drums, and keyboards. Effects can be edited and stored in an additional 259 fully programmable user memories, and up to six effects can be used simul-

taneously. The unit's vitals: reported dynamic range of greater than 90dB and distortion through the effect chain reportedly less than 0.03%. A switching power supply automatically operates at any voltage from 90 to 250V AC, 50-60Hz. Electro-Voice, 600 Cecil St., Buchanan, MI 49107. (616) 695-6831. Fax (616) 695-1304.

### GENERALMUSIC PRODUCTS.

Generalmusic has developed a rack-mount version of their S Series. The 19" **S2r** (\$1,995) offers desktop editing using undo, compare, and clipboard functions, 14 function keys, up to 32-note polyphony, and a 3.5" floppy drive that loads and

saves PCM data, sounds, songs, performances, and DSP effects. The unit's on-board sequencer has a 250,000-event memory incorporated into 16 tracks. Sequencer editing functions include real-time, overdub, quantize, and microscope. The sound library offers 500 sound programs that can be used with up to 100 performances and up to ten songs. Other features include graphic editing, an on-board librarian program, 32 programmable digital filters, six polyphonic outputs, and 16 multitimbral, 16 layer, and 16 split programs.

The S2r package also includes **Turbokit** (\$325), an enhancement board also available separately as an option for the S2 and S3, which expands the on-board factory sounds from 350 to 500 presets and adds 100 performance combinations. The internally installed option extends the pitch-bend range to  $\pm 12$  semitones and adds sys-ex functions not previously supported, such as real-time parameter control and memory dump. The board also provides a single-oscillator (for 32-note polyphony) sound mode and a 512K battery-backed RAM disk for storage of songs, samples, or performances. New sequencer features

include note-range filters and the ability to copy a single track from one sequence to another. Included with Turbokit is Sample Translator version 2.0, which can be used to create new waveforms by loading samples via MIDI in SDS format.

Generalmusic has also introduced the 61-key **WX2** (\$3,495; without multimedia card, \$2,995) and 88-key, weighted-action **WX400** (no price available) workstations, both with 14 programmable riffs, 96 styles, and the ability to display a song's melody notes, chords, and lyrics. Features include 32-note polyphony, a 16-track 250,000-event sequencer, 6Mb of ROM with 376 sounds, 16 sections with 16 split points, and a 3.5" disk drive that can load Standard MIDI Files. The WX2 has a built-in 40-watt stereo monitor system, while the WX400 offers three-way 80-watt stereo monitoring. Generalmusic Corp., 1164 Tower Ln., Bensenville, IL 60106. (708) 766-8230. Fax (708) 766-8281.

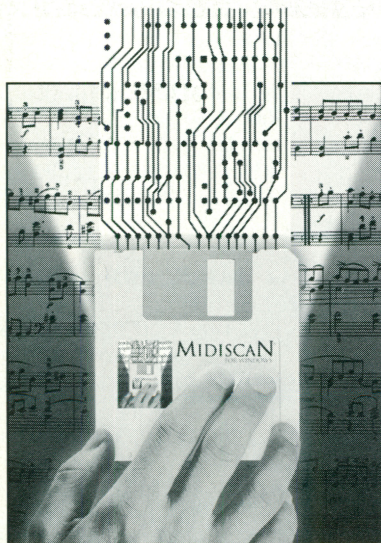
### SYNCLAVIER ENHANCEMENTS.

The **FastTrax** 2.4 gigabyte removable disk drive system (\$500) for PostPro random access multitracks increases available recording time to more



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than 1.5 hours per track at 44.1kHz. It also permits fast swap-out of disks during or between sessions, as well as off-line back-up. The PostPro stays on-line while the changeover is taking place so that no data is lost. BaxTrax, a Macintosh-based application, allows the user to back-up disks off-line to a DAT drive using any Macintosh.

If you own a Synclavier, you'll be interested in the new 64Mb **MegaRAM** cards (price not available). These cards increase the on-board sampling capacity of the Synclavier to 768Mb, for more than 2-1/2 hours of continuous recording time at 44.1kHz. Users can now work entirely in RAM. The cards are also compatible with the PostPro SD integrating sampling and disk recording system, increasing on-board memory up to 256Mb. The Synclavier Company, Rivermill Commercial Center, Lebanon, NH 03766. (603) 448-8887.

**CD RECORDER.** The Yamaha **CDR100** (approximately \$5,500) can record in all four standard CD formats: CD-ROM, CD-ROM XA, CD-I, and CD Audio. Selectable 1X, 2X, and 4X speeds are avail-

able. The CDR100 is suitable for use as an internal drive or a compact external drive. It fits within a computer's 5.25" disk drive housing and plugs directly into the PC's power supply, or can be connected through a SCSI II interface to the PC. The recorder can handle multi-mode options including disc-at-once (records the whole disc at once, no data added later), track-at-once (records only part of the disc, adding data later but not reading from the disc in the interim), or multi-session (allows the user to record part of the disc, read in the interim, and add data later). It can be used with CD-R discs, which are compatible with normal discs and highly resistant to data read and write errors. Yamaha Systems Technology Division, 981 Ridder Park Dr., San Jose, CA 95131. (408) 437-3133. Fax (408) 437-8791.

## ▲ SOUNDS

**CREATIVE CD-ROMS.** For EIII/EIIIx owners, Creative Sound Design offers three CD-ROMs with 280Mb of sound effects each in 8Mb bank loads. Volume 1 of the **Maximum Impact SFX Collection** (\$249 each;

all three, \$595; DAT demo, \$30) is Planes/Trains/Autos, Volume 2 is Industry/Home/Office, and Volume 3 is Ambience/Water/Nature. Creative Sound Design, 300 Lenora St., Ste. P-319, Seattle, WA 98121. (206) 441-7421.

**PRO-REC COLLECTIONS.** Pro-Rec's **K2000 library** includes four program disks, as well as several sample disks with 1.4Mb of new samples and 30 to 100 patches (\$19.90-\$44.90 per disk).

**Synth Collections** (\$69.90 per set) features eight high-density disks and over 11Mb of samples of Pro-Rec's patches for various synths, such as the Yamaha SY85, Korg 01/W and M1, and Roland D-50, D-70, and JV-80. Pro-Rec, Inc., 106 W. 13th St., Ste. 13, New York, NY 10011. (212) 675-5606. Fax (212) 627-3148.

**ENSONIQ SOUNDS.** Pegasus Sounds specializes in creating sounds for the Ensoniq SD-1. Their four volumes (\$25 each) of 60 sounds each range from new age, hard rock, and electric piano to organ, pop, and top 40. Pegasus Sounds, 6050 Adaway Ct., Grand Rapids, MI 49546-9615. (616)

676-0863. Fax (616) 956-7854.

**MORE ENSONIQ SOUNDS.** Eye & I's latest Voice Crystal release is for the Ensoniq TS-10 and the new TS-12. **VC3-TS10** (\$39.95) offers 60 new programs with patch-select variations. An extra disk of Ensoniq EPS-16 and ASR-10 samples that can be loaded into the standard TS units is also included in the package. Eye & I Productions, 930 Jungfrau Ct., Milpitas, CA 95035. (408) 945-0139. Fax (408) 945-5712.

**STILL MORE ENSONIQ SOUNDS.** Syntaur Production's **Soviet Synths** (\$34.95) is a four-disk collection of samples (20 sample files) from three Soviet-made analog synthesizers (including the Aelita) for the Ensoniq EPS, EPS-16 Plus, and ASR-10.

Syntaur has also re-edited, re-programmed the patch variations, and removed the copy protection in reissuing the Livewire Audio collection of Ensoniq Mirage samples. New samples added to the 11 disks (\$7.95 each; \$74.95 set) range from classic synths to sound effects. Syntaur Productions, 4241 W. Alabama #10, Houston, TX 77027. (713) 965-9041. (800) 334-1288. ■

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## DIGITECH TSR-24

Continued from page 145

manually from the front panel, the TSR-24 required a second of processing time before the patch was ready to be played. This can potentially be a problem if you're using the TSR as your sole processor and you need to switch patches quickly between, say, a verse and a chorus. A forthcoming EPROM upgrade will make patch changes instantaneous (contact Digitech for details).

**Test Time.** Our real-world tests involved using the TSR-24 in three different environments: a MIDI studio, a recording studio, and in several nightclubs. On all counts, the TSR performed impressively. During our MIDI studio tests, we were amazed at what the TSR did for our old DX7. If you're considering dumping your tired synth(s), you might want to first audition a device such as this in your setup.

How do the effects sound? We invited comments from several listeners during the course of this review, and the general consensus was quite favorable. The power presets (those in which the unit's entire memory is used for a single effect) found across-the-board favor. Reverbs that used the GigaVerb algorithm were silky-smooth, while the stripped-down MFX reverbs, as to be expected, were more on the warbly side. Obviously, less processing power equals decreased sound quality. Some of the combination and special effects patches, while creative, were a bit noisy. Others, though, simply knocked our socks off, including Auto Abyss (a thick, swelling chorus effect), the arpeggiated Dream Sequence (an ascending and descending whole-tone scale), and Auto Drum Roll (hit a note and a series of repetitions smoothly fades in underneath). The only negative we encountered here was an occasional noisy artifact or two when switching quickly between patches.

We schlepped the unit around on a weekend nightclub tour, and it worked flawlessly. Strangely though, it decided to take a permanent vacation when we returned it to the *Keyboard* confines. What happened? We're not sure, but it may have received a nasty electrical spike (it was raining that day). DigiTech promptly sent us a replacement unit and we were back in business.

**Conclusions.** This box is a winner. Its programming options are hands-down excellent, its "power" patches sound great, and the fact that any parameter can be controlled in real time via MIDI is a definite plus. So what are its shortcomings? Nothing too major: The unit is slow to activate new patches once they've been selected (a fix is on the way, though), the artifacts we encountered when quickly switching between certain presets were annoying, and we wish the center section of buttons could function as a numeric keypad.

Perhaps a more pertinent question is: How does it stack up against its competition? Pretty darn well. If a one-space effects monster is what you crave, and you're willing to lay down 800 bucks to get it, the TSR-24 would be hard to beat. ■

## LETTERS

Continued from page 7

quite pro, but getting there. I built my studio over the past six years or so, and it's only getting harder to resist "techno lust" as technology continues to progress.

Mike Milligan  
Geneva, NY

Reading Jim Aikin's "Home Studio Tool Kit" article was just like having my own personal consultant. The article is clear and precise; it hits almost every area of frustration and decision-making that I have encountered. You guys must have read my mind.

Eliud Herrera, Jr.  
Boston, MA

I would like to add one tip to your article on home studios, especially for low-end studio owners who own a VCR. Doing your final mix to the audio tracks of a hi-fi stereo VCR on S-VHS, Beta, or Hi-8 yields superior audio fidelity over most analog cassette decks. Some manufacturers advise that there be video on the tape for stability, so my mixes have unmemorable Mets games, the Indy 500, and French music videos.

David Kaufman  
New York, NY

### Sample Playback Rules

What's the deal with these "keyboard pilgrims" who are coming down on sample playback synthesizers [Letters, Nov. '93]? All of a sudden they're rediscovering their old synths and dissing the new synths. So why was their old gear stuck in the closet for so long? You people are fickle.

People who spend their hard-earned money on records don't care how you got your sound or where it came from. It's like these guitar players who can't get a decent sound without a tube. Transistor or tube, who cares? I suppose these old keyboard wizards are still using rotary phones, changing channels with a knob, and listening to the eight-track stereo in their '73 Dodge Darts. You dinosaurs need to get your priorities straight.

Francis Manucci  
Claymont, DE

### Tony Toni Toné

I had to laugh when I read about Tony Toni Toné [Nov. '93]. In the good old days, when men were men, we would have had three super groups out of nine people — Cream, Jimi Hendrix, Grand Funk, ELP, Rush, and Lee Michaels, just to name a few. Sorry, I'm not impressed. Besides, aren't these people the same basement band from the late '80s that were called the Nine Figs?

R.V.  
St. Paul, MN

### Amiga vs. PC

I don't know what Michael Marans is talking about when he says there are few MIDI applications for the Amiga. A recent letter in *Key-*

*board* noted that Bars & Pipes Professional is not only a superior sequencer but also a multimedia authoring platform capable of controlling many non-MIDI applications simultaneously. As for me, I have a multiport MIDI interface capable of 112 channels and an Amiga that's faster than a Sun Sparc workstation. I also have an editor/librarian, another librarian, two sequencers, and printing software. And I know of SunRize, a 16-bit sampling and hard disk recording system for the Amiga.

Just what *is* Marans's standard for a viable computer-based system? Why does Atari rate non-derogatory mention in *Keyboard* but not the Amiga?

Gary Goldberg  
Silver Spring, MD

*Keyboard's* position on the Amiga seems strange, especially in the light of recent letters to the editor from disgruntled Amiga users. We appreciate your mention of Bars & Pipes Pro in your Nov. '93 article on "a setup for any budget," but the paragraph in which it appears is so entirely negative as to be almost disparaging toward the Amiga. A few choice word changes could have easily pleased and appeased a section of your readership. The fact that you mention the Amiga and Bars & Pipes at all suggests that you consider it viable for *some* people. If that is what you're trying to say, just say so, instead of clouding it in negatively charged muck.

Mark Burton  
Blue Ribbon Soundworks  
Atlanta, GA

In 1978 I saw my first computer. In '81 I was hacking for Rockwell International. These experiences led me to choose my current system based on the criterion of powerful architectural design. When the hardware is thought out, the software comes naturally, which is why my Amiga 2000 has been a faithful companion for years. All the software for it was well conceived, and the need for new applications and revisions has been low. Music-X is my sequencer of choice, with its useful displays and features and near infinite user configurations.

The Amiga series was for those who had to do things in real time at the same time. Even at only 7MHz it's fast enough to do what you need a PC at 30MHz for. Its key is a flexible memory addressing system, priority-based multitasking at the lowest level, and exceptional graphics and sound.

The PC is a pig. It's gone the way of VHS, an inferior system that succeeded only because of established market share. With later DOS and Windows the pig is beginning to sing, but it's not a lyric soprano and it's not natural. Just go to a bookstore and check all the manuals that explain software and hardware that don't work well to begin with. The truth will become clear: There is far more money to be made on more than 15 million flawed PCs than the mere three million well-designed Amigas.

Those who live by the PC will die by the PC.  
Sean Henderson  
Hollywood, CA ■





Continued from page 87

before entering Global mode is the only way to make sure you are editing a kit that's used by that bank. Once in Global mode, select which of the two kits you wish to edit. (If you're editing a specific program, don't forget to check out which kit it's using.)

**Easy Access.** Holding down the A softkey and playing a key on the keyboard will cause the cursor to automatically scroll to that drum sound in the display. Once there, you can easily make changes to the drum's tuning, pan position, and so on.

**Voice Assignments.** A drum can be assigned to any of the nine voice groups (called "Exclusive Group" in the display). When drums are assigned to the same exclusive number, any one of them that is sounding

will be cut off when another drum in the same group is triggered. For example, by assigning all of the hi-hat sounds to the same group, you can cut off a sustained hit with a short one — just as on a real hi-hat. Other possibilities include choked cymbals, gated toms, and a variety of percussion effects.

**More New Sounds.** Don't forget that pitch-envelopes can be very effective on drums. Subtle envelopes with velocity routed to move pitch up can go a long way toward simulating the natural response of a drum being struck really hard. Or you can create fun effects, as demonstrated in programs A69 and B49.

Stacking drums can also be very effective. Check out combinations A09, B09, A49, and B49 for effects, pan assignments and layering possibilities.

• • • •

Armed with these tips, you should be able to take your 01/W anywhere and tackle any situation with confidence. The more you learn about your instrument, the less time you'll spend worrying about how Combination mode works, or how to make the sequencer do what you want, and the more time you'll spend making music. And to me, that's what it's all about. ■

## REEL WORLD NOTEBOOK

Continued from page 147

most of the time. Added to all this was the fact that the time allotted for dubbing this film was roughly half of what was needed. By the second day, we were already far behind, and tempers were getting hot. Hooray for Hollywood.

I was an advocate for quiet music, and overall contrast in the soundtrack: Loud parts should be very loud, and soft parts should be soft enough to make the loud parts seem even louder — a basic aspect of music production (and common sense) that seemed to elude the mixers on this film. They apparently had come from the sonic pudding school of film sound. They took great offense to most every suggestion of reducing or (God forbid) tossing sound effects.

Fortunately, for the most part, common sense prevailed, and the effects didn't eat up the entire soundtrack. The music was well mixed to the perspective of the film, and I left feeling that the film sounded surprisingly good. Many of my suggestions were used and seemed to be helpful. The director was pleased with the music, and only one cue was thrown out. All in all, a success, and now it was over. My first free afternoon in over a month. I weighed my options and decided to go to a movie. It was an action film loaded to the gills with chases, crashes, sound effects galore, and an over-the-top score. Everything the opposite of the film I had just finished work on. I loved it. ■

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Jan. '79 Cecil Taylor, Ragtime Piano, "The Entertainer."  
Feb. '79 Rick Wakeman, Carla Bley, Leonard Pennario, Pop Organ.  
May '79 Dr. John, Paich & Porcaro Of Toto, Dick Hyman.  
Jun. '79 Suzanne Ciani, Steve Reich, The Bosendorfer Piano.  
Jul. '79 Denny Zeitlin, Playing Studio Parts, Lorin Hollander.

**1980**  
Feb. '80 Peter Nero, Emanuel Ax, Amp Basics, Nero Solo.  
Jul. '80 Roger Powell, Art Tatum Runs, Organist Bill Irwin.

**1982**  
Apr. '82 Earl Hines, Peter Nero Solo, Terry Riley, OMD.

**1983**  
Sep. '83 TV's Paul Shaffer, Jazz LP Influences, Beirach Column.

**1984**  
Jan. '84 George Winston, Organist Jimmy McGriff, Warren Zevon.  
Feb. '84 Playing Lead Synth, Jazz Piano Trios, Peter Serkin.  
Mar. '84 Josef Zawinul, Ray Charles, Sight Reading Hints.  
Apr. '84 Joe Sample, Corea Solo, Lorin Hollander, Tom Coster.  
Oct. '84 IMPROVISATION SPECIAL: How-to, Why-to, When-to.  
Nov. '84 Rare Bill Evans Record, Tony Banks, Classical Improvisation.  
Dec. '84 Wendy Carlos Record, Mark Isham, "Eurythmics" Dave Stewart.

**1985**  
Jan. '85 Cecil Taylor, Toto Record, Teaching Piano, Moog Column.  
Feb. '85 Billy Cobham On Drum Machines, Hollywood's Jerry Goldsmith.  
Apr. '85 Suzanne Ciani Record, Richie Beirach Solo, Daryl Hall.  
May '85 England's Howard Jones, Build A Vocoder, "Misty" For Organ.  
Jun. '85 SYNTH PROGRAMMING SPECIAL: Getting Started, Patches, Ciani.  
Jul. '85 Patrick Moraz Record, Kate Bush, Lennie Tristano, MIDI column.  
Aug. '85 Keyboards In Japan, Tomita Record, Yamaha, Roland.  
Oct. '85 10th ANNIVERSARY SPECIAL: Chick Corea Record, Synth Technology.  
Nov. '85 Mark Isham Record, Talking Heads' Jerry Harrison, Bernie Worrell.  
Dec. '85 The Piano's Future, Samplers, Keyboards with Dire Straits & Sting.

**1986**  
Feb. '86 Do-it-yourself Software, 1st Electronic Film Score, Nick Rhodes.  
Apr. '86 New Age Aaberg Solo, Jean-Luc Ponty, Simple Minds.  
Nov. '86 Journey's Jonathan Cain, Wendy Carlos Record, Petrucci.

**1987**  
Jan. '87 EXPERIMENTAL MUSIC SPECIAL: Sampler Record, The Stars, History.  
Feb. '87 Frank Zappa, Zappa Record, Synth Glossary I.  
Mar. '87 TV's Paul Shaffer, Ashkenazy, Larry Fast, Glossary II.  
Apr. '87 Philip Glass, Glass Record, Arranging I, Use Old Gear.  
May '87 Human League, Tom Coster Record, Kitaro, Arranging II.  
Jun. '87 SEQUENCER SPECIAL: What It Is, Tips, Applications, Creativity.  
Jul. '87 Wind Synths, Bruce Hornsby, Soviet Record, USSR Keyboardists.  
Aug. '87 Jeff Lorber, Inside Roland, Pete Dinklage, The Cure, New Age.  
Sep. '87 Michael Omatian, DX711, Banks & Marinelli, Blues.  
Oct. '87 Miles Davis And Keyboards, Prophet 2000, Horace Silver.  
Nov. '87 Todd Rundgren, Roger Powell Record, MIDI Mixing, Rock Rhythms.  
Dec. '87 Accordion Revival, Zydeco Record, Roland D-50 Clinic.

**1988**  
Jan. '88 ONSTAGE SPECIAL: Performance Tips, Equipment Uses, Experiences.  
Feb. '88 Stewart Copeland On Rhythm, Little Richard, David Frank Record.  
Mar. '88 Computer Applications, L.A.'s David Foster, 19-tone Scales.  
May '88 Thomas Dolby, Toto Solo, Moog On Moog, The Synth Industry.  
Jun. '88 BACK TO BASICS SPECIAL: ABCs of Technology, Sampling Record.  
Jul. '88 Corea & Hancock, Rock Arranging, Programming the ESQ-1.  
Aug. '88 PIANO SPECIAL: Jazz Performance, Piano Future, Digital Pianos.  
Sep. '88 Sting's Keyboardists, Patrick O'Hearn Record, Schools.  
Oct. '88 New Age And Synths, T Lavitz Record, Metal Solo, IBM PC.  
Dec. '88 Bon Jovi's David Bryan, John Tesh Record, Fats Waller, M1 Clinic.

**1989**  
Jan. '89 Third-party Sounds, Corea & LaVerne Record, Elton John Solo.  
Feb. '89 Randy Newman, Billy Taylor, Practicing, Art Of Noise.  
Jul. '89 Mike + The Mechanics' Paul Carrack and Adrian Lee, FZ1 Clinic.  
Nov. '89 Rolling Stones' Keyboardists, Multi-Effects User's Guide, Chuckii Booker.  
Dec. '89 Laurie Anderson, Multi-Effects Buyer's Guide, Margaret Leng Tang.

**1990**  
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May '90 Jam And Lewis, The Future Of MIDI, "Blue" Gene Tyranny, Yamaha SY77.  
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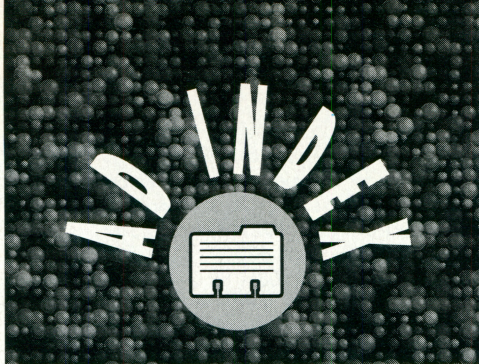
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